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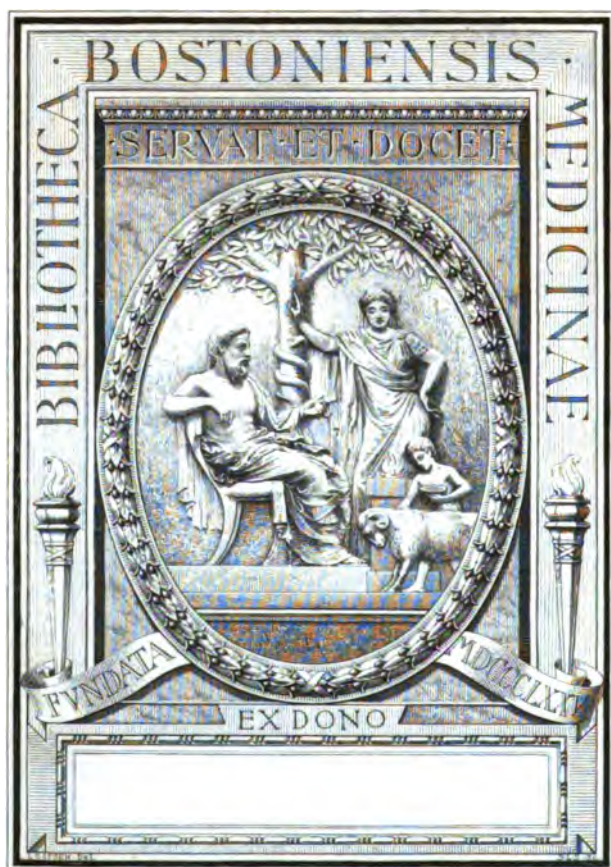
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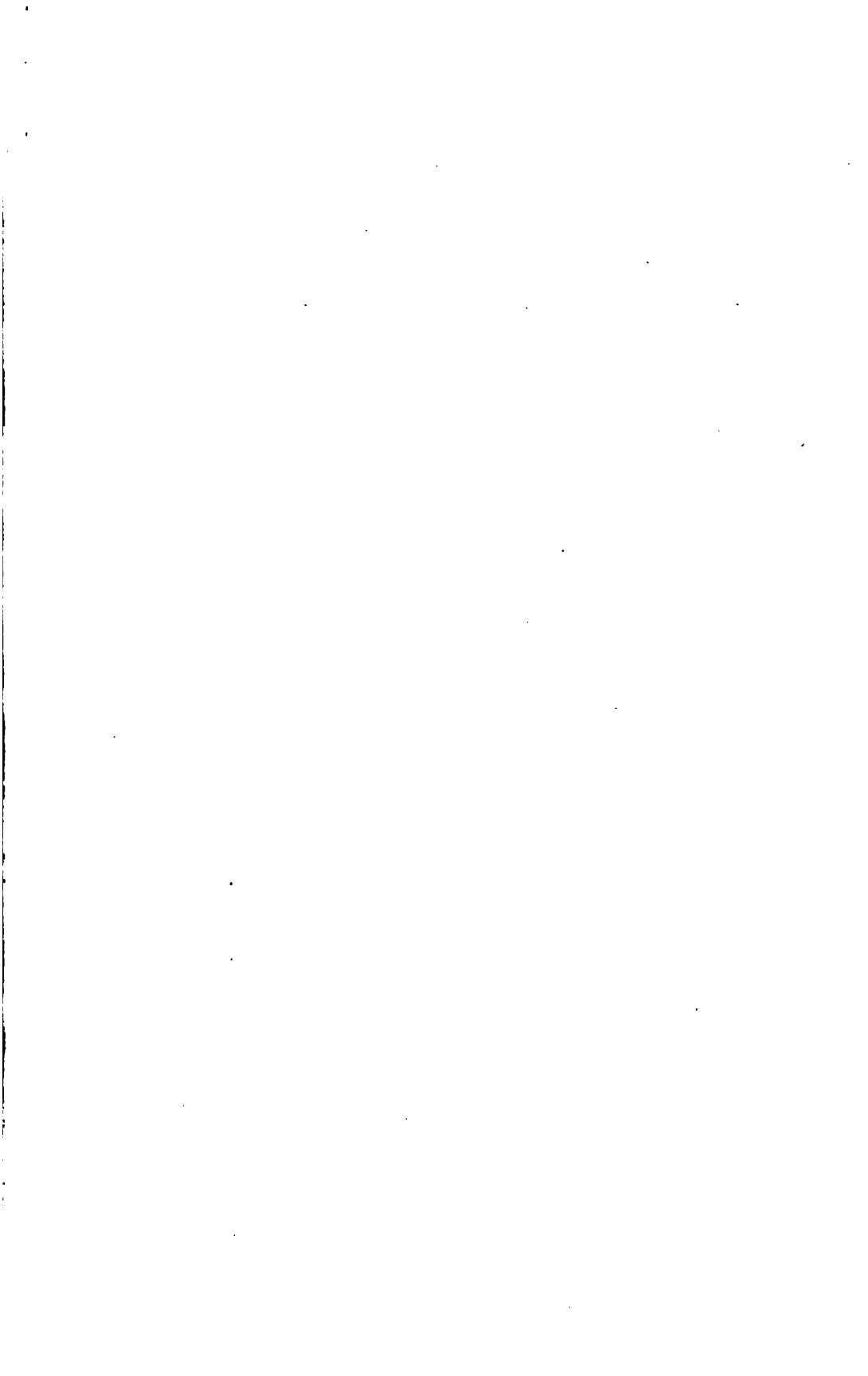
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# PROGRESSIVE MEDICINE.

A QUARTERLY DIGEST OF ADVANCES, DISCOVERIES,  
AND IMPROVEMENTS

IN THE

MEDICAL AND SURGICAL SCIENCES.

EDITED BY

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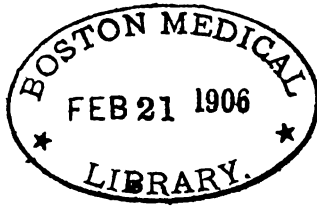
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DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS,  
AND BLOODVESSELS—DERMATOLOGY AND SYPHILIS—DISEASES  
OF THE NERVOUS SYSTEM—OBSTETRICS.

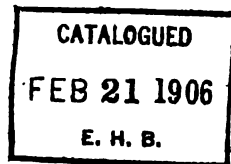


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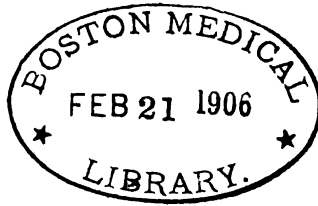
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# PROGRESSIVE MEDICINE.

SEPTEMBER, 1905.

## DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS AND BLOODVESSELS.

BY WILLIAM EWART, M.D., F.R.C.P.

### TUBERCULOSIS.

THE study of tuberculosis is receiving the unabated attention of pathologists all over the world. In the United States valuable work, under the guidance of Lawrence F. Flick, is published in the first volume of *Reports from the Henry Phipps Institute* and in the volume of *Studies from the Saranac Laboratory, 1900-1904*, under the directorship of E. L. Trudeau. An important place is devoted to the study of the tuberculin reaction, and of the temperature reaction, and the local reactions sometimes resulting from the injection of trypsin, peptone, and sodium cinnamate.

The two aspects of the tuberculosis crusade, suppression of the infecting agents and protection against infection, have been eloquently preached in every part of the world in all their details and do not belong to the scope of these pages. It is held by many, as by A. G. R. Foulerton,<sup>1</sup> that the larger preventive measure is not so much the building of sanatoria and the attempt at isolating the ubiquitous microbe, as the more vigorous exercise of the provisions of the public health acts. The special fields for antitubercle hygiene are the unhealthy homes, the overcrowded and ill-ventilated schools, workshops, offices, and public rooms of all kinds. The difficulty is how to apply the precepts so abundantly taught. Private and public apathy have to be overcome, as pointed out by C. W. Brasher,<sup>2</sup> in his remarks on the "Segregation of the Tuberculous among Factory Workers."

<sup>1</sup> Lancet, November 26, 1904, p. 1513.

<sup>2</sup> British Medical Journal, August 27, 1904.

The present state of the antituberculosis propaganda in the United States furnishes Knopf<sup>1</sup> with important suggestions for a more effectual co-operation of authorities, philanthropists, physicians, and laymen. An essential agency is that of the family physician. Knopf points out the invaluable services which he can render as a teacher, hygienist, and "prophylactiker," in addition to his care of the patients.

The hunt for tuberculosis must come to be the practical physician's daily occupation. His duty is clearly set out by Grancher, "*Il faut qu'il prenne l'offensive.*" Not enough that he should treat the patient, he should also take into his protection those who surround the invalid, and detect the disease in its earliest form. This work, "*avant tout une œuvre de bonte,*" and one from which the profession will not recoil.

The economics of tuberculosis is another great department of study, some of the lines of which are indicated by John R. Huber.<sup>2</sup>

Notice is also claimed for Marshall Langton Price's<sup>3</sup> elaborate investigation of the "Economic Course of Consumption in Wage-earners," illustrated by diagrams and tables. He concludes with the statement that it is possible to determine accurately, among many losses, the personal loss falling upon the individual, and from this the potential loss caused by his elimination from the field of production.

**Prevention.** Although the supply of more sanatoria and of more dispensaries is a necessity of the day, as is also the *notification of tuberculosis*, yet there is great force in the argument that prevention by improvement of the race is more important than the cure or the notification of individual cases, and that any public expenditure devoted to efficient measures for raising the level of public health would be more productive than any other.

Active, nay, aggressive, prevention is the logical development of the already accepted obligation of passive prevention or protection. S. A. Knopf<sup>4</sup> directs our special attention to the question "How the public school may be helpful in the prevention of tuberculosis?" And the same helpful notion finds an obvious opportunity in many other institutions—almost in all the aggregations of possibly tuberculized subjects, except, perhaps, in prisons and in lunatic asylums, where our good teachings might be largely thrown away.

The growing recognition of the importance of preventive measures applicable to early life is shown by the lectures and public addresses which have been delivered on that subject, and by the foundation of various institutions on the lines of "*L'Œuvre des Enfants Tuberculeux.*"<sup>5</sup>

<sup>1</sup> Journal of the American Medical Association, February 11, 1905.

<sup>2</sup> New York and Philadelphia Medical Journal, October 8, 1904.

<sup>3</sup> Journal of the American Medical Association, April 15, 1905.

<sup>4</sup> New York and Philadelphia Medical Journal, September 3, 1904.

<sup>5</sup> Lancet, March 11, 1905.

Much is being done, too, for the welfare of juvenile sufferers from surgical tuberculosis, as set forth by Sir William Broadbent,<sup>1</sup> and strongly advocated by Tubby.

All must agree with E. Dean Marriott<sup>2</sup> that no money expended in measures of preventive sanitation and education will ever fail to bring in its full return, although the vast majority will sympathize with the cry for more sanatoria to enable the victims in our generation to be relieved, even for shortened periods, and to utilize them, as long ago suggested by Arthur Newsholme, as "antitubercle schools." But there is a more economical and further reaching system, the dispensary system, now beginning to spread, and actively pushed in Paris by Robin and Grancher. As to the teaching of hygiene, it should be made compulsory in the curriculum of all our elementary schools.

**The Etiology of Tuberculosis.** Of the five channels of infection discussed in his Weber-Parkes' prize essay, in addition to the rare but not impossible transmission by the ovum, Hugh Walsham<sup>3</sup> finds that most frequently active are the lymphatics (including the tonsils), the blood-vessels, and the epithelial surfaces. The essay confirms most of our previously accepted etiological facts.

**TUBERCLE IN THE OESOPHAGUS** appears to have been noted by Krauss as a result of a lesion with subsequent infection from sputum, and by Zenker and Cordua at the periphery of a cancerous ulceration.

L. Rocher's<sup>4</sup> case occurred in a girl suffering from an oesophageal stenosis after swallowing caustic. During her treatment in the hospital she acquired pulmonary tuberculosis, and at the autopsy the presence of an oesophageal tuberculosis was revealed.

**IS THE CHEST OR THE ABDOMEN THE CHIEF SITE** of the primary tuberculous invasion in children? Upon this question, the importance of which is not restricted to child life, since the pulmonary tuberculosis of adults is often to be attributed to the existence of ancient caseous foci, we have now the reports of various careful observers. The latest utterance, that of W. P. S. Branson,<sup>5</sup> deals with relatively few but with thoroughly investigated cases, and the following results from an examination for every local trace of tubercle in 138 complete autopsies are a reliable basis:

Among the 138 bodies there existed signs of tuberculosis—active or obsolete—in 43. The primary lesions were distributed as follows:

Primary in bronchial glands or lung . . . . .	22 or 51. per cent.
Primary in intestines or mesenteric glands . . . . .	9 or 20.9 " "
Primary in petrous bone . . . . .	1
Doubtful . . . . .	11 or 25.0 " "

<sup>1</sup> British Medical Journal, April 22, 1905.

<sup>2</sup> Ibid., January 21, 1905.

<sup>3</sup> The Channels of Infection in Tuberculosis, London, 1904.

<sup>4</sup> Rev. Internat. de la Tuber., 1905, p. 202.

<sup>5</sup> British Medical Journal, January 14, 1905.

Branson's conclusions are to the effect that:

1. Among the children of the poor in London tuberculosis is absolutely most fatal during the first two years of life, but, relatively to all other causes of death, becomes progressively more fatal until the fourth year. 2. There is no specific relationship between measles and whooping-cough on the one hand and tuberculosis on the other. 3. Catarrhal lesions of mucous membranes are the paramount predisposing causes of tuberculosis in early life, and that measles and whooping-cough are potent in this regard only through the catarrhs accompanying them. 4. About 50 per cent. of children dying of tuberculosis have had neither measles nor whooping-cough. 5. While the infection of tuberculosis in childhood is mostly air-borne, primary infection of the abdomen is by no means a rarity.

It is remarkable that two other good observers working at the same hospital should have previously arrived at different figures as to the frequency of abdominal tuberculosis. Batten recording a percentage of 15, and Still of 23.4, while Price Jones, dealing with a smaller series, finds a percentage of 28.5.

The recognition by Branson that primary abdominal tuberculosis is not a rarity, as some would consider it to be, does not alter the fact of the preponderance of the pulmonary form of invasion, nor invalidate general conclusions that catarrhal lesions of whatever origin are the determining factor of tuberculosis in early life, and that the danger resides in them rather than in any specific infection, such as whooping-cough or measles, that may excite them. As a comment, let us add that the same etiology fits many cases of invasion at a later period, and that the treatment of catarrh which so often receives little attention is at all ages, but pre-eminently in infancy, a most urgent duty.

L. Kingsford<sup>1</sup> deals with the same subject by analyzing the postmortem records of 339 cases of all ages up to fourteen years (48 per cent. occurring during the first two years, and 80 per cent. during the first five years) from the East London Hospital for Children. Without attempting to follow Kingsford's important elaborations, we note that he ascribes to inhalation 63.7 per cent. of the cases, and to ingestion 19.1 per cent., leaving a doubtful residue of 17 per cent.

We cannot fail to recognize the general agreement between these various results, in spite of differences between the methods; and we may, for clinical purposes, adopt with considerable confidence the view that, while contamination of the milk or food must account for a good number of the cases of intestinal origin, the majority of the victims succumb to air-borne infection under the predisposing influence of catarrh. Bad

<sup>1</sup> *Lancet*, September 24, 1904.

air and all forms of catarrh, then, are the chief risks against which infant life claims our protection. Fortunately, in both directions a great deal is already being done, and much more is within the bounds of our possibilities.

At the same time, we should not forget that the great mortality from infantile gastroenteritis sweeps away prematurely a large proportion of those most predisposed to the abdominal form of tuberculosis, and that alimentary infection is probably more active than would appear from the foregoing returns. This is a reservation which entails upon us unrelaxing attention to the purity of the supplies, as well as to the much needed improvement in our methods of treating delicacy of the intestinal mucous membrane.

DUST INFECTION may be answerable for various morbid symptoms and for some of our diseases. Nevertheless, it must be owned that, in the case of dust, as in that of many other risks and discomforts, it is remarkable how much the strong healthy individual can stand. Mechanically, we are less vulnerable to dust than the insects, and less liable to be smothered. The other effect is the toxic, of which we know much less, but in which, under the comprehensive title of "Dust Disease," Robert Hessler<sup>1</sup> thinks he has traced the cause of many minor ailments and ill-defined troubles.

*Mouth-breathing* deprives us of an important safeguard against both evils. W. C. Rivers<sup>2</sup> has analyzed 67 cases in residence at three sanatoria, and found that 19.4 per cent. were mouth-breathers, and he quotes Moeller and Rappoport<sup>3</sup> in support of the very high percentage of the occurrence of some disease of the upper air passages as a preliminary to pulmonary phthisis.

VENTILATION. *Dustless Air* is a great desideratum in our habitations; its supply is not beyond the capabilities of modern engineering, and has, indeed, been achieved<sup>4</sup> in isolated instances by "screening" the air admitted into a building. The drawback is the air-tight closure of all other apertures which that method of ventilation necessitates, and the abandonment of the "open-window system" which we have labored to inculcate.

*Contamination of the Air of Rooms by Orators* with the *streptococcus brevis* of saliva and other micro-organisms has been proved by Mervyn Gordon,<sup>5</sup> of the Local Government Board, to take place to the extent of 10,000,000 per cubic centimetre.

<sup>1</sup> American Medicine, October 1, 1904.

<sup>2</sup> British Medical Journal, April 29, 1905.

<sup>3</sup> Zeit. f. Tuberk. u. Heilk., July, 1903.

<sup>4</sup> Editorial, Journal of the American Medical Association, October 29, 1904.

<sup>5</sup> Journal of the American Medical Association, October 22, 1904, p. 1242.

*Elevated Railways* in the congested districts of the poor are a distinct violation of the elements of town hygiene. A. S. Knopf<sup>1</sup> has written a timely article of protest against this evil.

**TUBERCLE FROM THE TUBERCULOUS VIA THE AIR** is the old conclusion impressed again upon Beitz<sup>2</sup> by all recent research; another source being, of course, bovine tuberculosis. In the latter instance contaminated air and milk are the dangers.

**CONVALESCENCE FROM SEVERE ACUTE INFECTIONS** is undoubtedly a period of bacillary danger, though not as implied by E. de Batz,<sup>3</sup> the only one. Were it so, a safe remedy could always be found in the resort to a climate such as that of Arcachon, equable in temperature and in moisture, marine, and yet free from the drawbacks of the open coast, where convalescents could undergo the "triple cure" by superæration, super-alimentation, and complete or modified rest.

**IS VALVULAR HEART DISEASE A PROTECTION AGAINST TUBERCULOSIS?** Norris<sup>4</sup> concludes that it exerts little if any influence, either causative or inhibitory, except in the case of pulmonary stenosis which does not seem to increase the liability of infection. The investigation, conducted on a basis of 7040 necropsies and of 1276 clinical histories, throws light also upon other questions of etiology second only in importance to the above.

*An Amended Classification* is proposed by Karl von Ruck,<sup>5</sup> in a valuable paper, which urges that the prognosis of cases should be a prominent element in classification, and also that the old distinction between "phthisis" and "tuberculosis" should be upheld. With these views most clinicians will agree.

**The Diagnosis and Prognosis. EARLY DIAGNOSIS.** The best method of early diagnosis is, according to Prof. Grancher,<sup>6</sup> skilled auscultation of the inspiration, which should discover no difference between the right and the left side. Impaired percussion resonance is the sign of a pasty engorgement or "*empatement*," which can only result months, or may be years, after the infection. And again, the discovery of bacilli is too late a sign. Tuberculin is dangerous; radiography is very uncertain; serum diagnosis is also indefinite and untrustworthy; cytodagnosis is liable to the same objection, and equally so is respiratory chemical analysis. Although Grancher's belief in respiratory changes as the earliest revelation is fully in accord with my own clinical experience, we cannot wisely cast aside the useful confirmation obtainable from the

<sup>1</sup> New York and Philadelphia Medical Journal, March 18, 1905.

<sup>2</sup> Berl. klin. Woch., January 16, 1905.

<sup>3</sup> Rev. Internat. de la Tuberc., 1905, p. 195.

<sup>4</sup> American Journal of the Medical Sciences, October, 1904.

<sup>5</sup> New York and Philadelphia Medical Journal, March 11, 1905.

<sup>6</sup> Rev. Internat. de la Tuberc., 1905, p. 142.

character of the expiratory murmur. It has its diagnostic value quite apart from the old belief in a "blowing expiration" as the earliest sign. One practical conclusion remains to be drawn from Grancher's utterance, and it is this: if our hunt for tuberculosis is to be efficient, we must be excellently mounted. Part of the crusade must be training of first-rate auscultators.

An excellent method is suggested by C. Giriho<sup>1</sup> for the education of the ear and for increasing its power of discrimination. He recommends that the student should undertake a systematic examination of the inspiratory murmur in a series of healthy subjects, listening in succession over symmetrical points in both sides of the chest, so that he may learn to appreciate the slightest difference in the quality of the respiratory murmur.

Early diagnosis is also discussed in useful papers by Cheney<sup>2</sup> and by Charles A. E. Codman,<sup>3</sup> who trust to the old methods of examination, rather than the new.

The earliest physical signs of pulmonary tuberculosis are also in the estimation of Lawrason Brown<sup>4</sup> the auscultatory. They are to be found, in the slight alterations perceptible in the character of the vesicular murmur. Auscultation is, therefore, by far the most searching method of physical examination in incipient tuberculosis.

*The Early Signs of Pulmonary Tuberculosis Include Myxœdema*, observed by William Stokes in 1830 and described in 1851 by Maurice Schiff under the name of "idiomuscular action." Henry L. Shively<sup>5</sup> contributes a clinical paper to its study. *Pityriasis Versicolor*, as pointed out by L. E. Bertrand,<sup>6</sup> is also often present on the thorax quite early in the affection, at a time when it might assist the diagnosis.

Much importance attaches to the differential diagnosis between incipient pulmonary tuberculosis, healed cavities, and non-tuberculous fibrosis, a study contributed by George W. Norris<sup>7</sup> to the Henry Phipps Institute.

*The Diagnosis of Enlarged Bronchial Lymph Nodes* is shown by Alfred Friedlander's<sup>8</sup> excellent paper to have received very insufficient help from auscultation and percussion, but we should not forget that radioscopy may afford valuable aid. Meanwhile, Friedlander lays stress upon the *lymphocytosis*, which he regards as characteristic, and he sug-

<sup>1</sup> Gaz. degli Osp., 1904, No. 85.

<sup>2</sup> American Medicine, October 22, 1904.

<sup>3</sup> Medicine, Detroit, May, 1904.

<sup>4</sup> Medical News, October 15, 1904.

<sup>5</sup> New York and Philadelphia Medical Journal, January 14, 1905.

<sup>6</sup> Sem. méd., April 12, 1905.

<sup>7</sup> New York and Philadelphia Medical Journal, July 16, 1904.

<sup>8</sup> Journal of the American Medical Association, January 7, 1905.

gests that irritation of the tracheobronchial glands in measles and in pertussis may set up the lymphocytosis which is usually attributed to the infection in these diseases.

*Inequality of the Two Radial Pulses* has been noted by J. Sorgo<sup>1</sup> in 8 per cent. of a series of 397 cases of pulmonary tuberculosis. This inequality, which varies with the position of the limb and disappears in certain attitudes, is to be explained by the influence exercised upon the subclavian artery by the retraction of pleuro-pulmonary indurative lesions of the apex. This may occasionally prove to be, as suggested by Sorgo, a useful confirmatory sign.

*Hyperglobuly in Tuberculosis.* S. Mircoli<sup>2</sup> seeks to explain the marked hyperglobuly which he has traced in cases of limited local torpid tubercle, to the stimulating effect of the small doses of tuberculin absorbed from these lesions. The details of the research are given by S. Rebaudi and L. Alfonso.<sup>3</sup>

*The Vagus Reflex* described by T. J. Mays,<sup>4</sup> varying in intensity from mere tenderness to dyspnoea and vertigo, was elicited on the same side as the lesion in 97 per cent. of the patients examined and in only 3 per cent. on the opposite side. Mays regards the reflex as valuable for prognosis, as well as for diagnosis.

*Phthisis May Be Closely Simulated by Pulmonary Syphilis.* An instance in point is related by William E. Hughes and Robert N. Willson,<sup>5</sup> where repeated hæmoptysis and some of the other signs of phthisis were present, but no bacilli had been found. Rapid improvement set in as soon as iodide of potassium was administered, and the patient made a good recovery.

*The Spontaneous Curability of Pulmonary Tuberculosis* is much less in childhood and youth than afterward. Blumer and Lartigau<sup>6</sup> find that the *spontaneous healing age* occurs ten years earlier for females, and the maximum of active cases of disease also ten years earlier than in males.

**The Laboratory Methods of Diagnosis and Treatment.** OPSONINE. WRIGHT'S TEST FOR ITS ESTIMATION. Considerable impulse has been given to serotherapy and to the use of tuberculin by Wright's discovery of a method of estimating, and, within certain limits, of modifying the resistance of the blood to bacillary invasions, and of raising the efficiency of its phagocytes. Opsonine is the name given to a protective body in the serum, the action of which is to cause the bacilli to fall an easy prey to phagocytes. The opsonic coefficient of any given serum is represented

<sup>1</sup> Wien. klin. Woch., December 15, 1904.

<sup>2</sup> Editorial, Journal of the American Medical Association, September 10, 1904.

<sup>3</sup> Gaz. degli Osp., 1904, xxv., No. 70.

<sup>4</sup> New York Medical Journal, September 3, 1904.

<sup>5</sup> Medical News, February 25, 1905.

<sup>6</sup> California State Journal of Medicine, September, 1904.



by the number of bacilli ingested by leukocytes in the space of fifteen minutes, when the serum to be tested is brought into contact with leukocytes and with bacilli.

While the administration of tuberculin tends ultimately to raise the opsonic power of the blood, it is apt to be followed at first by a negative phase of diminished resistance. This can be recognized, thanks to the test, and avoided as unfavorable. This method thus renders available the advantages of tuberculin without the risks, and very encouraging results have been reported by Wright from tuberculin treatment regulated by this means.

**VACCINATION AGAINST TUBERCULOSIS.** Wright and Douglas<sup>1</sup> contend that the blood's opsonic index and its agglutinating index are available as tests of the degree of resistance to tubercle possessed by the individual. Whether or not protective substances are present in the blood at birth—and it is well known that von Behring<sup>2</sup> regards the newborn as specially susceptible to all infections because of the immature state of their intestinal epithelium—they consider that tuberculotropic substances (*i. e.*, substances entering into combination with the bacillus) are capable of elaboration in man in response to the inoculation of a tubercle vaccine.

**PROTECTIVE DIRECT INOCULATION, VACCINATION, OR "JENNERIZATION (von Behring)**—*i. e.*, the direct injection of bacilli of attenuated virulence, such as the human bacillus passed through the slow worm (Moeller), or such as the tortoise bacillus (Friedmann), has been largely tried in animals. Moeller finds that the serum of animals Jennerized from the slow worm strongly agglutinates human bacilli. He claims that the slow worm bacillus is non-pathogenic to warm-blooded animals, and that its tuberculin also has immunizing power. Moeller<sup>3</sup> has Jennerized himself, and subsequently exposed himself to the danger of tuberculosis by the direct intravenous injection of a small dose of a culture of human bacilli, fortunately, without paying the penalty for his rashness.

**LEUKOCYTOSIS** is not a feature of pure miliary tuberculosis,<sup>4</sup> but of the mixed infection with pyogenic cocci. The aim of much of our modern treatment by overfeeding is to set up instead of leucopenia a salutary leukocytosis, such as follows the use of yeast, or of nuclein, or the intravenous injection of sodium cinnamate (Landerer), or its injection under the skin (Lovell Drage), or more simply an abundant proteid dietary. According to Bardgwell vegetable proteids are as efficacious in this respect as butchers' meat, although inconveniently bulky.

**TUBERCULIN.** The new as well as the old tuberculin of Koch and various serums are now being more widely used. The present time is,

<sup>1</sup> Lancet, October 22, 1904.

<sup>2</sup> W. Gessner. Zentralblatt f. inn. Med., August 6, 1904.

<sup>3</sup> Zeit. f. Tub. u. Heilst., 1904, Bd. v., Heft 3.

<sup>4</sup> Practitioner, April, 1905.

therefore, opportune for a brief comparative review of these agents, such as that supplied by C. H. Cattle.<sup>1</sup>

*Koch's Old Tuberculin*, containing some of the toxins formed by the bacillus and some glycerin, was obtained in 1890 from old cultures filtered free from germs. One milligram injected under the skin produces a sharp pyrexial rise and an inflammation around the tuberculous focus, be it lupus at the cutaneous surface, or an intrapulmonary lesion. This is the "reaction" which has continued to be utilized as a diagnostic sign even when the therapeutic use of the tuberculin was given up.

*Koch's "Tuberculin R.,"* brought out in 1897, contains 10 mm. of ground-up dead bacilli in each cubic centimetre of the suspending fluid. The initial dose is  $\frac{1}{500}$  of a milligram of the solid substance, or less if a reaction should occur.

*Koch's "New Tuberculin"* followed in 1901. It likewise consists of powdered bacilli (the dose of which is  $\frac{1}{400}$  of a milligram) suspended in 50 per cent. of glycerin, and is heated for an hour to 60° C., to ensure its not containing any living bacilli.

No tissue necrosis such as that originally obtained accompanies the pyrexial reaction due to these later tuberculins. Their purpose is rather that of a vaccine intended to gradually stimulate the tissue-cells to a higher resistance, and to a secretion of protective substances, as shown by an increasing agglutinative power of the blood. Cattle believes that the new tuberculin has a useful future in this direction.

*Is Pyrexia a Contraindication to the Use of Tuberculin?* C. H. Cattle<sup>2</sup> also briefly considers this practical question. He points out that while the injections are generally reserved for the absolutely or nearly apyrexial stages, Koch uses a modified tuberculin, even in febrile cases. Wright has also reported good results in a case where the injections were made when the temperature was 100° F. Cattle believes that in cases of persistently high fever, Maragliano's or Marmorek's serum might be tried.

*The Choice of Cases Suitable for Treatment by Tuberculins* is ably discussed in a lecture by H. Batty Shaw.<sup>3</sup> He calls attention to the infections known as perlsucht or bovine tuberculosis, as avidin, and as fish tuberculosis, all characterized by acid-fast and alcohol-fast bacilli, and also the allied affections capable of arising from inoculation with outlying representatives of the group, such as butter bacillus of Petri and Rabinowitsch, the timothy bacillus growing on *phleum pratense* (Moeller), the grass bacillus, the mist bacillus, the Belzig milk bacillus (Moeller), the tortoise bacillus (Friedmann), etc. Shaw furnishes us with an instructive critical review of the chief bacteriological remedial agents at present or

<sup>1</sup> Practitioner, April, 1905.

<sup>2</sup> Clinical Journal. May 3, 1905.

<sup>3</sup> Ibid.

recently in use, with an account of their reported results. *The statistical* proof of the value of treatment by Koch's tuberculins is supplied by Moeller's tabulated figures.<sup>1</sup>

**I. MOELLER'S COMPARATIVE RESULTS OF SIMPLE SANATORIUM TREATMENT, AND OF THE SAME COMBINED WITH BACILLARY EMULSION (T. E.) TREATMENT, AT BELZIG.**

Form of treatment. Total number.	Cured.	Markedly improved.	Improved.	Unchanged.	Worse.	Dead.
General methods (772)	85 11 p. c.	215 28 p. c.	274 36 p. c.	162 21 p. c.	29 3.2 p. c.	7 8 p. c.
General methods combined with tuberculin (T. E.) (193)	58 30.1 p. c.	92 47.6 p. c.	33 17 p. c.	10 5.3 p. c.		

**II. MOELLER'S COMPARATIVE RESULTS, WITH REFERENCE TO THE THREE STAGES OF TURBAN.**

Stage and mode of treatment.	Cases.	Healed, per cent.
Stage 1. General methods	236	33.1
General methods combined with tuberculin (T. E.)	89	52.8
Stage 2. General methods	240	2.9
General methods combined with tuberculin (T. E.)	63	17.6
Stage 3. General methods	296	
General methods combined with tuberculin (T. E.)	41	

The most suitable cases for tuberculin are, of course, those of Stage 1; and even in spite of some fever, the less extensive lesions in Stages 2 and 3 may, according to Koch, also be treated. The "closed" tuberculosis cases (no bacilli in sputum) are the more favorable ones (Petruschky).<sup>2</sup> Petruschky's "interval treatment" provides for periods of some months' continuous treatment, and for a renewed examination, and, if necessary, renewed treatment by tuberculin after three months' interval. He has obtained cures in 100 per cent. of his cases.

*The Indications* to persevere with the treatment are: 1. Permanent fall of temperature. 2. Progressive gain in weight. 3. Progressive general improvement and appetite. 4. Progressive diminution of catarrhal signs.

*The Chief Contraindications* to the use of tuberculin are tabulated by Shaw as follows: 1. Steady loss of weight and strength. 2. Irregular pyrexia, continued for some days. 3. Secondary infections. 4. Hæmoptysis. 5. Heart disease. 6. Any suspicion that the serous coverings of the brain or spinal cord are involved. 7. The presence of the diazo reaction. 8. Albuminuria. 9. Tubercle of the alimentary tract. 10. Advanced emphysema. 11. Extensive pleural effusions. 12. Laryngeal tuberculosis. 13. High-pulse frequency. 14. A highly nervous temperament.

<sup>1</sup> Zeit. f. Tub. u. Heils., 1904, Bd. v., Heft. 5.

<sup>2</sup> Berliner klin. Wochen.. 1904, No. 188.

*The Various Tuberculin Preparations* may be conveniently tabulated as follows:<sup>1</sup>

T. (1890).	"The original tuberculin" of Koch.	From media in which human bacillus has grown. Heated to 110° C., and filtered. No risk of inoculation. Produces local reaction. A diagnostic agent.
T. O. (1897).	Not used. (Tuberculin "oberer.")	
T. R. (1897).	"Tuberculin R." (Tuberculin "Rückstand.")	Filtered watery extract from powdered crushed bacilli + 20 per cent. glycerin, not sterilized by heat. Produces no local reaction. A remedial agent said to be immunizing.
T. A. (1897).	Not used. (Tuberculin alkalinum.)	
T. E. (1901).	"Bacillary emulsion."	Clear fluid decanted from powdered bacilli in a 50 per cent. glycerin solution. A blood agglutinant in reference to tubercle bacilli. Hence thought to be an immunizer. Fever no objection to its use.

Other tuberculins or tuberculin-derivatives are enumerated by Batty Shaw:<sup>2</sup> Denys' tuberculin; Béranck's tuberculin; Hirschfelder's "oxy-tuberculin;" Hunter and Kühne's albumoses, from the "original" tuberculin; Ruppel's tuberculinic acid; Klebs' tuberculocidin and antiphthisin; Hahn's tuberculo-plasmin (obtained from masses of bacilli by hydraulic pressure).

*The Bovine Tuberculin* known as P. T. O. is used by Carl Spengler,<sup>3</sup> on the strength of its protective effect on guinea-pigs inoculated with the bacilli of human tubercle.

*The Tuberculin Test by Inhalation.* E. Kapralik and H. v. Schrötter<sup>4</sup> have ascertained in a series of 28 cases that the test succeeds just as well by inhalation as by injection; only a thirty times larger dose is required—viz., 30 mg. in active cases and 250 mg. in latent pulmonary tuberculosis. They have also traced a decided therapeutic effect in connection with the test. They believe that the two methods might be combined with advantage.

Various changes are described by M. Sciallero,<sup>5</sup> of Maragliano's laboratory, as occurring in the tubercle bacilli found in animals immunized with tuberculin, which he has failed to observe so abundantly in non-

<sup>1</sup> Clinical Journal, May 3, 1905.

<sup>2</sup> Loc. cit.

<sup>3</sup> Deutsche med. Woch., 1904, No. 31.

<sup>4</sup> Wien. klin. Woch., 1904, Bd. xvii., No. 22

<sup>5</sup> Gaz. degli Osp., October 23, 1904.

immunized animals. He suggests that the discovery in the sputum of these degenerate and distorted bacilli may have a favorable significance.

Tuberculosis conveyed to a monkey by inhalation is reported, by Marzagalli and Figari,<sup>1</sup> to have been completely cured with Maragliano's serum, as was demonstrated at the necropsy.

MARAGLIANO'S ANTITUBERCULAR SERUM, derived from horses immunized with sterilized cultures, claims to be destructive of the life of the bacilli, as well as of their toxin. The dose is 1 c.cm. The results of the 2900 cases published are encouraging, but are not much better than the results of the ordinary sanatorium methods, of which these cases had had the benefit. Cattle does not think that other observers have succeeded in obtaining results equally favorable from the use of Maragliano's serum.

MARMOREK'S ANTITOXIC SERUM is also obtained from horses immunized with a carefully filtered culture, a culture rendered specially toxic by growing a strain of "young bacilli" in a medium of leukotoxic calf serum and glycerin liver bouillon. The toxin in question is supposed by Marmorek to be that which, he believes, is secreted under the stimulus of Koch's tuberculin injection and is responsible for the reactions. Of the antitoxic serum thus obtained, 5 c.cm. are injected on four consecutive days, followed by three days' rest, for a prolonged period. The verdict on this serum has been far from unanimous; but the later reports seem to be more favorable than those published at first, and the serum is now fairly under trial. Cattle draws attention to the unpleasant drawbacks to the use of horses' serum (rashes, pyrexia, etc.).

Marmorek's serum has been used in several cases of chronic phthisis by Frey, who reports 9 of them in detail in the *Munchener med. Wochenschrift*, 1904, No. 44. The aggregate number of his injections was about 350. The usual method was to inject 3 c.c. the first day, and increasingly more daily until 8 c.c. were given on the tenth day. After this first series came a pause of eight to ten days, and then a fresh series of daily injections, raising the dose up to 20 c.c.; and after a second pause a similar series was resorted to. The extensor aspect of the arm was the site preferred. Frey is able to say for the serum that it is well borne, although not free from the complications of local reaction with its slight pyrexial influences and of serum rash, nor from an initial rise in the slightly pyrexial cases, to be followed, however, by a distinct and lasting fall.

A favorable effect was traced in the pure tuberculous pyrexia. In the expectoration there was likewise a transient initial increase, but afterward a marked diminution. Allowance being made for the Davos climatic advantages, the treatment itself still seemed to Frey to deserve credit for

<sup>1</sup> Gaz. degli Osp., October 23, 1904.

genuine results. But he admits that further experience is needed to justify the larger claims advanced in its support.

G. P. Teleny,<sup>1</sup> in an experience with 3 cases, speaks unfavorably of its capability and of its risks.

BOVINE TUBERCULIN SERUM has been suggested by Nathan Raw as likely to be hostile to the bacillus growing in human lungs, because those patients who have recovered from forms of tuberculous disease which he deems to be of bovine origin are immune against the human bacillus.

Karl Spengler, of Davos Platz, has published identical views, and is carrying out extensive clinical observations, the results of which have appeared to him to be very satisfactory, although other observers in Davos have not been so well pleased with the method.

HÆMOANTITOXINE is a new form of antitoxin, for administration by the mouth, in doses of a tablespoonful before meals four times daily. Figari,<sup>2</sup> who has tried it in a few cases in Maragliano's clinic, is satisfied that it did good and increased the agglutinating power and the antitoxic power of the serum.

For *Glandular Tuberculosis*, Giuseppe Ricci<sup>3</sup> recommends 5 c.c. injections of serum obtained from animals previously immunized by injecting aqueous extracts of living bacilli. An interesting feature in this method is the local application of compresses saturated with the serum.

*The Administration of Serum by the Mouth* is a recent method noticed by Hollen.<sup>4</sup> Porteus, MacDonald and others have given diphtheria antitoxin by the mouth and by the rectum with satisfactory results. Hewlett, however, does not believe in its absorption by the bowel; and Oppenheimer doubts whether it can resist gastric digestion.

The tuberculin test has been administered in this way by Freymuth,<sup>5</sup> who finds that the effect is satisfactory, provided gastric juice is excluded.

THE SERUM DIAGNOSIS originated by Arloing and Courmont was fully described by them at the St. Louis Congress.<sup>6</sup> They claim that, although the agglutination may fail in some advanced cases, it occurs in the earliest stage in advance of all physical signs.

**The Treatment of Tuberculosis.** MEDICINAL THERAPEUTICS. Occasional therapeutic retrospects are wanted, such as that by J. Edward Stubbert.<sup>7</sup> He has arrived at the significant conclusion that to prescribe climate alone would be equally culpable as to ignore climate, diet, hygiene in favor of medicinal or other treatment. Our duty lies in a judicious, scientific combination of the two basic lines of treatment. If that principle

<sup>1</sup> Roussky Vrach, October 16, 1904.

<sup>2</sup> New York and Philadelphia Medical Journal, April 30, 1904.

<sup>3</sup> Gaz. degli Osp., October 23, 1904.

<sup>4</sup> Medicine, March, 1905.

<sup>5</sup> Journal of the American Medical Association, February 25, 1905.

<sup>6</sup> Boston Medical and Surgical Journal, 1904, vol. cli., No. 23.

<sup>7</sup> Medical News, April 16, 1904.

be recognized, our office as physicians is not altogether resigned to the open-air sanatorium architect and to the cook. Nay, our responsibility is deeply involved in finding the healing agent which, by curing lungs more quickly, shall solve the social problem of tuberculosis. Who can gainsay that good effects have resulted from various remedies? Let us not resign all hope of less partial success to come. Open air cannot be improved, but there is no limit to the yet undiscovered in science.

Meanwhile, disappointment is tempered to the lung sufferer by his utter faith in pure air, which renders less heavy to bear the broken promises of specifics. The latest sensation was loletin or griserin<sup>1</sup> as an alleged infallible internal antiseptic, and for a while hopes ran high at Davos. Schomburg's trial of it in 12 cases<sup>2</sup> yielded no beneficial results.

*Anarcotine* is loudly praised and recommended for clinical trial by J. H. Frazer.<sup>3</sup> We must await further reports.

*Arsenic* is still strongly recommended by Renon, of Paris,<sup>4</sup> who also uses creosote, guaiacol, or thiocol, urea, tannin or tannigen (4 grains at a dose), and glycerophosphates. *Diarrhœa* is best treated with cotoin (2 grains in wafer) or methylene blue (2 grains, with lactose, in wafer).

*Treatment by Calcium Salts* is a recurring idea tried and tried again. Its recommendation by A. Michelazzi<sup>5</sup> is backed chiefly by the good effects of large administrations of calcium phosphate in the experimental tuberculosis of animals. Was the phosphoric acid the beneficent agent? Rudolph's advocacy is based upon a limited number of clinical results, which give some support to Michelazzi's contention.

*Intravenous Injections of Hetol (Sodium Cinnamate)* administered by T. Barrett Heggs<sup>6</sup> to 7 of his patients for periods of from six weeks to six months, in doses varying from 20 to 50 mgm., produced well-marked leukocytosis and decided benefit. He recommends the treatment as a useful adjunct.

The hetol injections of Landerer have also proved satisfactory in the hands of R. Blum,<sup>7</sup> but he cannot yet vouch for the permanence of his cures.

On the other hand, O. Prym,<sup>8</sup> who treated 22 cases, including severe ones, reports rather unfavorably as to the effect upon the latter. As a fact, Landerer originally intended his method for early and apyrexial cases only. F. Schrage,<sup>9</sup> who has followed that rule for upward of four years, has had good results, but does not profess to have cured all the cases treated by him.

<sup>1</sup> K. Kuester, Berliner klin. Woch., October 24, 1904.

<sup>2</sup> Ibid., January 2, 1905.

<sup>3</sup> Medical Press, February 15, 1905.

<sup>4</sup> Lancet, 1904, No. 4234.

<sup>5</sup> Münch. med. Woch., 1904, No. 44.

<sup>6</sup> Lancet, November 26, 1904.

<sup>7</sup> Gaz. degli Osp., 1904, xxv., No. 40.

<sup>8</sup> Therap. Monats., June, 1904.

<sup>9</sup> Ibid.

*A Simplified Method of Intratracheal Injection* is used by Mendel<sup>1</sup> with very satisfactory results. After trying various solutions, he finds most benefit from sterilized oil (1 to 3 drachms), containing from 6 to 9 c.c. of *eucalyptol*. The technique consists in drawing out the tongue, directing the tip of the curved syringe horizontally toward the opposite wall of the pharynx, and forcibly driving the injection against the latter, so as to cause it to rapidly drop down into the larynx.

*Iodine and Carbon Disulphide Inhalations.* A strong advocacy of iodine remedy, originally recommended by Stovall and Twitty,<sup>2</sup> and also approved by Coromilas, of Athens,<sup>3</sup> is put forward by C. I. C. Atkeson<sup>4</sup> in a letter to which is appended an editorial note describing the method. Coromilas used the *carbon disulphide* hypodermically, and ascribed its value to the penetrating power of the drug as to its action upon the bacillus. The addition of iodine precludes its hypodermic use. Further clinical reports are needed.

*The Iodoform Injection* originally described by Thomas W. Dewar<sup>5</sup> in 1903 is now practised by him with a modified solution, 40 per cent. liquid paraffin being added to the ether to render it blander and more easily introduced into the smallest veins. Half a grain of iodoform will partly dissolve in 10 minims of paraffin, and this preparation has sometimes been used alone, but is more suitable for joints. His later experience has confirmed his early opinion of the great value of the treatment. The results reported are undoubtedly good.

*Cyllin in the Treatment of Pulmonary Tuberculosis.* W. C. Lodwidge<sup>6</sup> has treated 8 cases, including advanced cases, by inhalations of cyllin, with encouraging results, such as steady increase in weight, diminution in the sputum, and relief from cough and night-sweats. Tested against vigorous cultures of the bacillus typhosus, cyllin is twelve times as powerful as carbolic acid, and, although harmless, is superior in its relative bactericidal value to the various disinfectants used as inhalants. Further, cyllin may be inhaled without any deleterious results.

Cyllin was isolated by Ainslie Walker after prolonged research on the suggestion quoted from Pellicani by Sir Lauder Brunton,<sup>7</sup> that substances containing a diphenyl nucleus are less poisonous and at the same time more powerfully antiseptic than those containing a single phenyl nucleus.

**HYGIENE.** A special group might be constructed to include the more tonic measures of hygienic treatment, such as climate, altitude, respira-

<sup>1</sup> Bull. de l'Acad. de Méd., 1904, Bd. lxxviii. No. 25

<sup>2</sup> New York Medical Journal, April 25, 1896.

<sup>3</sup> Journal of the American Medical Association, November 26, 1904.

<sup>4</sup> Ibid., February 4, 1905.

<sup>5</sup> British Medical Journal, November 21, 1903; *ibid.*, January 14, 1905.

<sup>6</sup> Lancet, February 11, 1905, p. 377.

<sup>7</sup> Croonian Lectures, 1889.



tory, and general exercises (Fernand Lagrange, Rosenthal, J. Madison Taylor,<sup>1</sup> Fleming).<sup>2</sup>

Other agents, such as mechanical vibration, electricity, x-rays, and other physical methods are advocated as aids to the cure in two papers by Arnold Snow and by J. D. Gibson.<sup>3</sup> We are still, however, very uncertain as to the degree of hygienic value attaching to these modern developments.

*Work Itself*, a systematic "work cure," analogous on different lines to the "rest cure," has been ably advocated by Herbert J. Hall,<sup>4</sup> in an original article on "The Systematic Use of Work as a Remedy in Neurasthenia and Allied Conditions." Although in pulmonary tuberculosis physical rest has to be enforced in the majority of cases for considerable periods, there comes a time when the convalescent needs to be re-educated to activity, and should not be denied the tonic treatment by systematic occupation. This is a truly hygienic method, but one requiring above all others judgment and adjustment.

**HÆMOPHTYSIS.** *A Case of Fatal Hysterical Hæmoptysis* recorded by M. N. Pende<sup>5</sup> is said to be unique in literature. The patient was a robust girl, aged seventeen years, always healthy, but recently depressed by her sister's death from phthisis. The hysterical stigmata were undoubted; but there was absence of pulmonary signs and of bacilli and elastic fibres and mucus in the sputum. In the hospital the recurring hæmoptysis was controlled by suggestion, as hysteria was diagnosed; but it returned in a fatal form at home. A careful examination of the lung revealed no lesion (Marchiafava). Pende regards the hemorrhage as due to diapedesis, and he calls attention to the perfect imitation of the disease presented by hysteria in this case. The temperature had reacted to tuberculin; but the guinea-pigs inoculated with the sputum did not suffer.

*The Treatment of Hæmoptysis* is viewed among us from very different standpoints. *A priori* reasoning and beliefs do not alter the hard facts of practice. C. H. Cattle<sup>6</sup> distrusts ergot and adrenalin, because of their vasoconstricting effect; but let us not forget that vasoconstriction is worth securing at the bleeding spot. Likewise, it is open to question whether there is more of risk or of advantage in the vasodilatation obtained by means of drugs such as nitroglycerin.

*The Arterial Pressure Dilemma in the Treatment of Hæmoptysis* shows no signs of being cleared up. Ergot, once banished because of its power-

<sup>1</sup> New York and Philadelphia Medical Journal, October 8, 1904.

<sup>2</sup> Edinburgh Medical Chirurgical Society, February 1, 1905; Medical Press, February 15, 1905.

<sup>3</sup> Journal of American Therapeutics, New York, July, 1904.

<sup>4</sup> Boston Medical and Surgical Journal, January 12, 1905.

<sup>5</sup> Il Morgagni, July 9, 1904; British Medical Journal, September 10, 1904.

<sup>6</sup> British Medical Journal, January 14, 1905.

ful pressor effect, is recommended again by H. Hyslop-Thomson<sup>1</sup> (in the form of *ergotin* injection) in the hæmoptysis preceding or accompanying menstruation. The exactly opposite agent, *amyl-nitrite*, is praised by Francis Hare.<sup>2</sup> He reports very good results from the amyl nitrite inhalation.

W. B. McLaughlin<sup>3</sup> has also treated cases successfully by injection with nitroglycerin ( $\frac{1}{100}$  grain), and with morphine ( $\frac{1}{4}$  grain), and strapping the chest on the bleeding side.

*Calcium Chloride Rectal Injections* are used by H. Hyslop-Thomson<sup>4</sup> in the following manner: "Immediately on the onset of hemorrhage the head and shoulders should be raised and a hypodermic injection of morphine given ( $\frac{1}{8}$  to  $\frac{1}{4}$  grain). Then 30 to 40 grains of calcium chloride dissolved in a small quantity of water should be injected high into the rectum, and an ice-bag applied to that part of the chest immediately underlying which is the most active tuberculous focus. At the same time the determination of blood to the lower limbs should be encouraged by the application of heat."

The rectal injection can be made through a soft catheter, after bending the knee and hip, without any disturbance to the patient. Calomel is always useful—mineral acids, alum, and iron only in mild cases. But the application of heat to the abdomen is prescribed by Hyslop as a routine measure. On the whole, the combination of remedies which he employs fulfils the urgent indications with a minimum of discomfort to the patient, and is worthy of trial.

He has also tried *adrenalin*, but is not in favor of its administration.

The subject of blood coagulation in its therapeutic aspects is also dealt with by Leo Loef<sup>5</sup> and by Gley and Richaud.<sup>6</sup>

Among other remedies found of use by individual observers, the subcutaneous injection of *atropine* (0.0002 to 0.0006 gm.) repeated on six consecutive days was successful in the hands of W. O. Woltke<sup>7</sup> after all other remedies had failed.

The measures specially recommended by H. Hochhaus,<sup>8</sup> in addition to ice locally and internally and to a compressing bandage, are the subcutaneous injection of *gelatin*, which he finds of much value, and *compression of the veins* of the limbs.

<sup>1</sup> British Medical Journal, December 17, 1904.

<sup>2</sup> Lancet, November 19, August 20, and October 1, 1904; also Journal of the American Medical Association, March 4, 1905, p. 728.

<sup>3</sup> Medical Record, September 17, 1904.

<sup>4</sup> British Medical Journal, December 17, 1904.

<sup>5</sup> Medical News, April 1, 1905.

<sup>6</sup> Presse méd., 1904, No. 32.

<sup>7</sup> Med. Oboz., Bd. lxi., No. 2; Journal of the American Medical Association, February 4, 1905.

<sup>8</sup> Deutsche med. Woch., January 31, 1905, Bd. xxxi.

*A Hæmogelometer to Time the Coagulation of the Blood* for clinical purposes has been invented by U. Biffi.<sup>1</sup> It consists of a platinum wire made into a chain of five small loops intended to be charged with blood from the bleeding puncture. A test-tube half-filled with water at 68° to 77°, and provided with a thermometer passing through a perforated cork (which also holds the wire) is the means of determining by successive submersions of each of the loops the time which must elapse (nominally between seven and ten minutes) before the blood is set into a clot which will not diffuse in the water.

FOR THE TREATMENT OF NIGHT SWEATS, H. Ulrici,<sup>2</sup> states that atropine, agaricine, camphoric acid, guaia-camphol, and camphorate of pyramidon stand in a decreasing scale of efficacy. Ulrici adds to the list *veronal*, to be administered at bedtime in a small dose of 5 grains every night until it succeeds. The sweating usually stops after three nights.

**The Sanatorium and Home Treatment.** THE SANATORIUM TREATMENT OF PHTHISIS. IS IT WORTH WHILE? W. B. Ransom's<sup>3</sup> question is answered by himself from impressions, even more than from statistics. The readiness of medical men when attacked with phthisis to resort to a sanatorium is sufficiently eloquent. He agrees with Walther that the prognosis of bad cases cannot be framed without some continued observation. This suggests the value of a stay of probation in an urban hospital, a course which I have often advocated for the sake of the opportunities for treatment, as a means of eliminating the hopeless cases which nothing can assist. Sanatoria and hospitals are indispensable, even though their benefits are not always permanent. But homes are also wanted for the isolation of advanced cases, as well as the useful "out-nursing" or "dispensary" system, which was, it appears, first elaborated by Philip in 1887, and also independently evolved by Calmette in Lille and by others. Ransom's question might be perhaps modified thus: "Is the sanatorium the best money's worth?"

It would serve no practical purpose to chronicle the opposing arguments in the paper war which has been waged over this question, nor to enter into the details of the many sanatorium statistics. We may accept it as proved even by the least successful results that there is every inducement to make us persevere and progress in the path which has been struck.

PERFECTION IN SANITARIUM TREATMENT HAS NO FINALITY. This is my own answer to any doubts expressed as to its value. "Open air" was given to primitive man. Though brilliant and successful, is its

<sup>1</sup> *Cronica Med.*, Lima, xx., No. 372; reported in the *Journal of the American Medical Association*, November 19, 1904.

<sup>2</sup> *Therap. Monats.*, December, 1904.

<sup>3</sup> *British Medical Journal*, January 14, 1905.

rediscovery much of an advance? More effective treatment is wanted than mere deck-chair life. With Henry Ashby<sup>1</sup> we must begin with *ante-natal nurture and prevention*, and follow this up with infantile and juvenile hygiene, and with the teaching of hygiene at schools. As individual need arises for sanitarium treatment, the lessons of hygiene, of physiology, and of clinical medicine in all its branches should co-operate with the primordial requisites of food and air. Frederick L. Hill's<sup>2</sup> excellent paper indicates how much scope is afforded in physical hygiene alone for the endless ingenuity and personal labor of the physician. Simon Baruch<sup>3</sup> still advocates hydrotherapy among the physical remedies, and many others during the past year contribute to the same phase of therapeutics.

*Special Hospitals Based on the Sanitarium Plan* and situated in the country are, in Guido Salvini's<sup>4</sup> deliberate opinion, after two years' experience of the special ward system at the Ospedale Maggiore of Milan, the only form of hospital relief which can be recommended. They would not, however—any more than can sanatoria—solve the question of public prophylaxis by isolation; and we are driven back to a study of the preventive factors in individual hygiene.

"A SANATORIUM ON WHEELS" for consumptives is proposed by Walter H. Haw,<sup>5</sup> in the shape of a six months' journey through South Africa in a bullock wagon.

"Superannuated trolley cars" are an analogous style of residence. They were suggested by William H. Peters,<sup>6</sup> but when the offer of some old cars was made to the Hudson County Board of Freeholders,<sup>7</sup> the conclusion was arrived at that tents would be cheaper and more serviceable.

H. Boyd Masten's<sup>8</sup> architectural plans for "An Ideal Tent Life in Southern Colorado and New Mexico," also appear to be too primitive for practical application.

OPEN AIR IN THE BED-ROOM. The accompanying illustrations of the ingenious *window tent*, described among other practical methods in an excellent paper by S. A. Knopf and W. B. McLaughlin,<sup>9</sup> hardly need any comment, but it will repay the reader to consult the original.

The "Villa Tournesol," made of brick, stone, and iron, and built at Dr. Pellegrin's suggestion by Eugene Pettit<sup>10</sup> on a steel turn-table, can

<sup>1</sup> Lancet, October 1, 1904.

<sup>2</sup> Journal of the American Medical Association, February 18, 1904.

<sup>3</sup> Medical Record, August 13, 1904.

<sup>4</sup> Rev. Internat. de la Tuberculose, 1905, p. 196.

<sup>5</sup> Lancet, April 8, 1905.

<sup>6</sup> New York and Philadelphia Medical Journal, December 10, 1904.

<sup>7</sup> Lancet, April 8, 1905, p. 966.

<sup>8</sup> New York and Philadelphia Medical Journal, November 19, 1904.

<sup>9</sup> Ibid., March 4, 1905.

<sup>10</sup> Ibid., October 22, 1904.

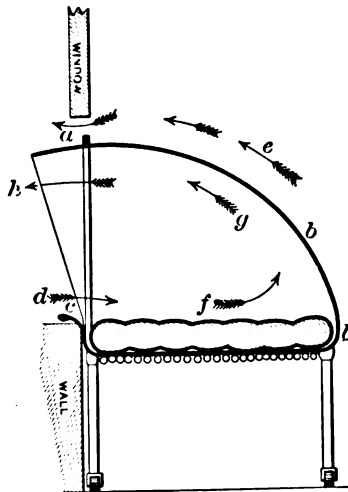
be worked round by two men, so as to follow the aspect of the sun. It is properly supplied with drains and water.

FIG. 1



Window tent for the open-air treatment at home. The frame of the tent does not quite fill the lower half of the window; a space of about three inches is left for the escape of the air of the room.

FIG. 2



Cut of window tent, showing ventilation. The awning is made of stout duck and is waterproof. The patient enters the tent through a flap, which can be made either on the right or the left side of the tent.

THE TREATMENT AND THE CONTROL OF THE PATIENT IN HIS HOME is felt by Lawrence F. Flick<sup>1</sup> to be the only chance for the great majority. If consumption is to be wiped out, it must be by the education to be obtained at dispensaries organized to meet the great demand for individual relief of all cases, and for the protection of their environment. S. A. Knopf's<sup>2</sup> strong advocacy of dispensary methods is also well known.

Among the *errors in treatment* enumerated by Norman Bridge before the Chicago Medical Society (October 5, 1904), not the least is the abuse of climatic treatment. In more than half the instances it was advised for the wrong kind of cases, or at the wrong time, or for the wrong people; that is, with poor regard for all the circumstances in the situation.

On the other hand, R. W. Craig,<sup>3</sup> writing from Arizona, which, with the Southern California, Western Texas, and the Nevada regions, enjoys much sunshine and dryness, with good altitude, urges the claims of climate against those of home treatment for those who can afford it.

The abuse of the climatic treatment<sup>4</sup> is nowadays largely gratuitous, since sound and experienced advice is amply available, though too little sought. Excluding "impossible" cases, the climatic cure is good in the proportion in which it can be combined with real sanitarium treatment. Sea air is good; but life at sea cannot at present be made sanitarial.

SANATORIUM OR CLIMATE? The merits of this question could not be discussed by one more competent than a physician who, like Dr. Ronald Campbell Macfie,<sup>5</sup> has practised for years in a selection of health stations, inland and marine, tropical and glacial, and also sanatoria for the upper classes and for the lower classes in the three kingdoms. In respect of both lines of treatment, it may be said "*experto crede.*" But to those without any experience of either he would recommend to take on trust sanatorium rather than the climate. In matters of climate, personal knowledge is indispensable; the untravelled cannot command the practical knowledge, though he may be guided by the data and figures of physical geography and by accepted principles. Among the latter, general recognition is awarded to the advantages of cold over heat, of dryness over moisture, of stillness over wind, and Burney Yeo stipulates for a daily variation of 20° F. The supreme value of the still and trans-radiant air of the altitude in suitable latitudes cannot be imagined until personally experienced, neither can it ever be forgotten thereafter. Yet, in discussing the "Utility and the Futility of Sanatoria," Macfie states positively that "all climates except relaxing ones are good," and that

<sup>1</sup> American Medicine, July 30, 1904.

<sup>2</sup> Medical Record, July 23, 1904.

<sup>3</sup> New York and Philadelphia Medical Journal, December 3, 1904.

<sup>4</sup> Journal of the American Medical Association, November 19, 1904.

<sup>5</sup> Scottish Medical and Surgical Journal, January, 1905.

"the results obtained at sanatoria are better than those obtained by ordinary climatic treatment."

Sanatoria for the upper classes for various reasons, including after-cure, give more satisfactory results. Even in Germany, one in five of the "arrests" among the poor lasts for four years. As at present constituted in Great Britain, sanatoria for the poor are medically inefficient and economically wasteful. Three essentials are needed for turning out 80 to 90 per cent. of cures instead of 20 per cent., with the 1000 beds which are available. 1. Administrative machinery to collect and select cases. 2. Sufficient endowment to enable patients to be treated till cured. 3. Extramural workers to look after the homes and families of the patients during their absence.

*The Influence of Aspect and Exposure and the Evil Influence of Rainy Winds.* The facility with which a selection can be made in most countries between districts of different soil, conformation, and exposure for the best available treatment of consumption renders exceedingly important any definite information as to what should be avoided and what should be required in any site selected. Careful attention is, therefore, claimed for the elaborate investigation which W. Gordon,<sup>1</sup> of Exeter, has undertaken in support of his indictment against exposure to rainy winds. His endeavor has been to assess their damaging influence in comparison with any influence traceable to soil, altitude, temperature, dry winds, especially when dusty, rainfall, density of population, insanitation, poverty, occupation, race, preventive measures, other forms of tubercle, other respiratory diseases, and malaria.

His conclusions are that altitude has, *per se*, probably no influence at all; dry winds probably little effect; rainfall probably none by itself; density of population, insanitation, and poverty a definite influence, but less marked; prevalence of other forms of tubercle, of other respiratory diseases and of malaria apparently not any effect. The influence of exposure to rainy wind, therefore, appears to have a greater effect in increasing the phthisis death rate than any other influences, except those of extreme differences of race and of difference of occupation.

It would be otherwise inexplicable that in Devon the phthisis mortality in the most exposed rural district should have been more than twice as great as that in the least exposed; and than when females only were considered (as less likely than the men to be much out of their own parishes), the exposed parishes actually gave, in two different districts, five times and seven times the rate of mortality of the sheltered parishes.

**Diet in Pulmonary Tuberculosis.** In our modern treatment of pulmonary consumption, besides rest, there are only two essentials, open air

<sup>1</sup> Lancet, January 1 and January 14, 1905.

and food. The crusade undertaken some years ago has been largely successful in overcoming rooted prejudice in the masses and heresy in our previously accepted teachings. Although much remains to be done, it can be said that unanimity now prevails as to the need for open air, as to its virtues and as to its mode of application.

For various reasons, including the pathetic one of hard facts, an open crusade has not been instituted in connection with the remaining essential. Indeed, we have not had a sufficiently definite doctrine to teach, and uncertainty has resulted among the body of the profession from a lack of unanimity among the experts on some vital points. The time has arrived when more attention should be bestowed upon the matter of diet, with a view to the framing of principles and of simple rules which may with safety and benefit be widely published for general adoption. Before this can be done, careful consideration will be needed for a series of questions which still occupy the field of discussion and which are obviously difficult to settle. The function of respiration and the composition of air are comparatively simple. Alimentation is a much more intricate subject, and it is vastly complicated by the manifold aspects of the individual factor.

In my opinion there is no clinical question that could possibly be submitted for conclusions at the next Congress of Tuberculosis with more profit and greater urgency. The following questions are those which naturally suggest themselves: "What should be avoided as harmful in relation to food and drink?" "Which are the principles as regards the frequency, the quantity, and the composition of the supplies?" "Which are the available easily digested foods which should be most largely represented in the dietary of tuberculosis?"

**THE FOOD AND THE STOMACH.** Two distinct principles are usually confused under the comprehensive heading of "Overfeeding in Consumption." One of these is to feed and fatten the patient; the other is to train and strengthen the stomach. They correspond to different stages. During those of fever and feebleness gastric training cannot be thought of. The patient must be fed in spite of the stomach, and almost without its co-operation. Even in cases of complete prostration of the digestion, I shrink from resorting to exclusive alcoholic support, for alcohol contains less food than whey, or even than plain solution of lactose or of albumen. These are typically foods for absorption and not for digestion. During the pyrexial stage of any ordinary cases the dietary should be largely made up of these easily assimilated supplies. Milk and eggs, cream, meat-juice, predigested starch, and the sugars are all available, and can be administered and assimilated almost without any appetite and digestion. The stomach benefits at least as much as the rest of the body; it is rested and yet overfed.



Totally different is the other plan, which can only be gradually applied, that of working up the efficiency of the stomach by a progressive stress upon its function; that it may gradually engage more and more of the entire body energies in the work of alimentation. For those eating or digesting all day like the herbivora, relative bulk and coarseness of food is required. The object is to fill the stomach, and to make it earn its peptones by hard work. This is the plan usually understood under super-alimentation. But the richer and readily absorbable foods need not be excluded; they can be thrown in over and above the solid supplies in judiciously measured proportions.

**THE PERSONAL FACTOR IN PRACTICAL DIETETICS.** On reviewing the literature of the dietetics of pulmonary consumption, I am impressed with the insufficient attention given the factor of individual metabolism. How great the extremes of personal variation in this respect must always be in connection with each of the elements of diet may be guessed from the contrast between enormous gains in weight and no gain whatever from forced feeding in any given series of healthy individuals. In disease, also, individual peculiarity must tell; and we may conclude that the most desirable proportion between the several constituents of food is a personal question to be answered apart from the generalized experimental observations.

**THE INDIVIDUAL CAPACITY FOR UTILIZING SUGARS AND FATS** is one of the most important points for determination in relation to our patient's diet. But a distinction will have to be made between three distinct notions; (1) The capacity for holding, (2) the capacity for storing, and (3) the capacity for utilizing the several foodstuffs. The fate of the sugar ingested is rather easier to trace by our urinary methods than that of the others, and it happens to be very important.

**THE RELATIVE VALUE OF THE ELEMENTARY FOODSTUFFS** has never ceased to be under investigation since the pioneer labors of von Liebig, von Pettenkofer, Voit, von Ranke, and Moleschott, and the ingenious researches of Lawes and Gilbert, which have been followed by the calorimetric investigation into their energy values by Rubner and others. More recently inquiry has been directed to their intimate vital effects upon the metabolism of tissues, on the one hand, and on the other to the correlated structural changes (as in diabetes, gout, rickets, scurvy, and many other affections) within the cells, including the wandering leukocyte, with its great potentialities. None of these studies are foreign to phthisiology, to which every collateral advance is a gain.

**EXCESSIVE RAW MEAT DIET**, analogous to the Salisbury raw meat and water diet, has been tried by Chalmers Watson<sup>1</sup> on various animals for

<sup>1</sup> *Lancet*, February 11, 1903.

the purpose of inducing gout. Healthy fowls after thirteen to sixteen months exhibited great enlargement of the thyroid and parathyroid glands, with changes similar to those of parenchymatous goitre in the human subject. Analogous results were obtained in rats. We are not concerned with his views as to the infective origin of gout, but merely with the possible bearing of these observations upon the dietetic question in phthisis. Meanwhile, Richet reports further experimental evidence in support of his zomotherapy in the *Revue de médecine* for January, 1905; and a strong plea is also entered by R. W. Philip<sup>1</sup> from the side of practical clinical experience.

"Nutrigen" powder, advocated by Laferre,<sup>2</sup> is beef predigested with artificial gastric juice and dried below the temperature of 40 per cent. He claims that it preserves the zomotherapical value of fresh meat.

In strange contrast with this nitrogenous superalimentation are the recent observations on physiological economy in nutrition by Chittenden and his coworkers, quoted by W. D. Halliburton.<sup>3</sup> They fed themselves for prolonged periods on diets with only half Voit's standard amount of proteid, and yet maintained their nitrogenous equilibrium. In connection with proteid absorption, Halliburton mentions that a much more complete proteolysis occurs in the alimentary canal than was formerly supposed. The tissue proteids would, therefore, seem to be capable of construction from the simple cleavage products; so that the living organism could construct from the fragments the tissues peculiar to itself, and maintain its chemical integrity, although the food taken might vary widely in composition. The part played by the tissue enzymes during life has received among other proofs that of the recent discovery of the urea-forming ferment, argenase.

IN CONNECTION WITH THE DIETETIC VALUE OF FATS as saving nitrogenous tissue waste, Laufer's<sup>4</sup> simple experiments, which may readily be checked by any clinician, would show that sugar is a much more efficient help. A uniform basis of diet being adopted in the shape of 3 litres of milk per day, the effect of adding to this 50 grams, either of cod-liver oil or of sugar, could be judged. The nitrogenous output was only slightly diminished by the oil, the body weight also falling slightly; but the output was distinctly reduced, while the gain was marked under the influence of a sugar diet.

At Verona, R. Massalongo and G. Danio<sup>5</sup> have had excellent results from sugar, as much as 100 to 500 grams being added to the daily diet.

<sup>1</sup> Practitioner, February, 1905.

<sup>2</sup> Rev. Internat. de la Tuberc., 1905, p. 191.

<sup>3</sup> British Medical Journal, March 11, 1905.

<sup>4</sup> Bull. gén. de therap., etc., November 15, 1904.

<sup>5</sup> Rif. Med., 1904, Bd. xx., No. 51.

The gain was sometimes greater than the amount of sugar ingested. Coffee, milk, or some bitter may be used to disguise the taste. It is a good substitute for cod-liver oil and suitable in febrile or slight pyrexial cases.

**THE SALINE CONSTITUENT IN FOOD.** Too little attention is usually paid to this fourth group in our foodstuffs, which is most essential in phthisis, with its ruinous catabolism of tissue. The phosphates are as it were the backbone of our cells, and the prominent part taken by them in the liberation of energy is shown by the large phosphatic output after brain work, as well as after muscular exertion. The characteristic depression peculiar to phosphatorrhœa suggests that in the wasting and depression of consumption there would be a special value in a high storage of phosphates as a reserve if it could be secured. This indication is already partly met by the method of superalimentation. It might, however, be still better served by a more direct supply. There is, therefore, good reason for the administration of the hypophosphites long ago recommended by Churchill. My own practice is to prescribe them liberally, regarding them as food rather than as medicine. The hypophosphites and the glycerophosphates have both been extolled. I now give them in combination as a powder or in a syrup, as their salts of sodium, calcium, and iron can now be procured in a soluble form. Three grains of each of the six salts can easily be dissolved in water flavored with syrup of orange, with or without the addition of strychnine, and the dose taken either in the interval between or shortly before or after the meals. This, I believe, fulfils a most important requirement in the scheme of tissue reconstruction.

**IS ALCOHOL A FOOD?** This theoretical question perpetually crops up in a practical clinical form, and from time to time it is submitted to renewed investigation. Quite recently W. E. Dixon,<sup>1</sup> of Cambridge, has arrived at the following conclusions: "Alcohol in small concentrated doses increases the rate of the pulse, the systole of the heart, constricts the deeper vessels, and increases the blood pressure, especially when the heart's action is feeble; it is therefore of great service in fainting. If much diluted it has little effect on the heart, but acts as a food, replacing starch in maintaining the heat of the body. In too large doses it depresses the heart."

The fact that the organism can extract some food value even out of alcohol is but too apt to be misconstrued into a statement that the latter is a useful nutritive agent. And this belief is the more likely to spread among the public if supported by professional utterances, such as have recently been published in the United States. There is clearly a wide difference between the view that alcohol is beneficial in consumption, as well as

<sup>1</sup> British Medical Journal, March 11, 1905, p. 538.

in some other diseases, and statements such as those by A.C. Latham,<sup>1</sup> that when food cannot be taken by consumptives alcohol is a sheet-anchor, and that "nothing but good results from the administration of large quantities of alcohol, when fever is present, so long as the pulse is becoming slower, the appetite better, the skin and tongue more moist, and the patient quieter." This can only refer to emergencies, not to routine of treatment. I hold with Knopf, who declares that in any stage or form of pulmonary tuberculosis large quantities of alcohol are contraindicated. In direct opposition to those who look to alcohol for an additional element of nutrition, we should dread any such contribution as a Danaan gift. The danger lest it should play its part in earnest as a "substitute," and exclude the due assimilation of genuine foods is too great to permit that we should prescribe it for the sake of a temporary stimulation. The better rule is to keep our patients independent of alcoholic beverages, even at meals; although Detweiler at Falkenstein practised to the letter, in regard to alcohol, also the precept to feed consumptives on the most gout-producing plan. The precept is a good one with that single reservation; but there are stimulants less risky than alcohol, and there are much richer available sources of carbohydrate—*e. g.*, sugar, in addition to the fats and to the easily assimilated nitrogenous preparations. The call for alcohol, even as an emergency food, is, therefore, reduced to very small limits.

The bacteriological elucidation of the alleged protective use of alcohol against infection has been attempted by C. Fraenkel,<sup>2</sup> who has studied the influence of alcohol upon the susceptibility of rabbits used to cultivate bacteria in connection with the infection of cholera and of typhoid. Their capacity to furnish a serum with specific characteristics was not diminished, but slightly increased by long-continued administrations of alcohol. But the author reserves his opinion as to any corresponding results upon man, and much less could he derive therefrom any conclusions as to the tuberculosis infection.

WEIR MITCHELL'S FEEDING METHOD, which sacrifices exercise for the development of fat and muscle, has furnished Abrams<sup>3</sup> with the best results; he continues it until the increase in weight warrants active exertion instead of passive movement and faradization. Abrams depends largely upon the helpful influence of light, of air, and also of the physician's suggestion upon the capacities of digestion.

<sup>1</sup> Practitioner, January, 1905.

<sup>2</sup> Berliner klin. Woch., January 16, 1905.

<sup>3</sup> Medicine, October, 1904.

## THE PLEURA.

**The Diagnosis of Pleurisy** has two aspects, as pointed out by G. A. Gibson, the examination of the patient by ordinary clinical and by *x*-ray methods, and that of the fluids (by cytology and bacteriology), and by thorough examination of the sputum, blood, and urine.

**PHYSICAL SIGNS.** *Grocco's Paravertebral Triangle of Dulness* is easily made out in the left chest when the pleural effusion is on the right side. It must be understood that this dulness is not to be compared in intensity with that obtained over the effusion, and that it is not suggestive of the presence of any fluid in the sound pleura. As a fact, it is merely a modification of the resonance of the normal contents of the latter.

FIG. 3

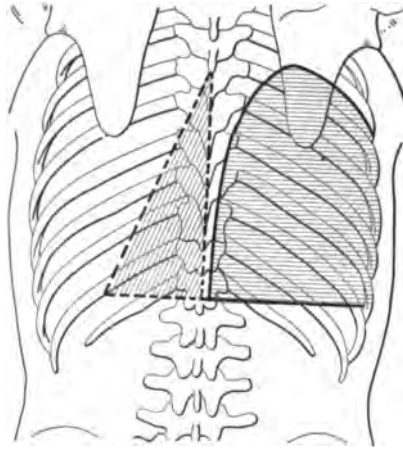


Diagram of Grocco's triangle.

A simple diagram is best suited to convey the description and the explanation. The position of Grocco's triangle is as follows: Let us imagine the presence of an effusion in the right chest; the well-known curve of the upper limit of dulness, which was first described by Damoiseau, determines the upper level or angle of Grocco's triangle. Its lower level is that of the twelfth rib and of the bottom of the pleural sinus. The outer angle varies, in its horizontal distance from the spine, between 6 and 10 cm.

It will be seen that the greatest width of this dull patch is much below the level of the cardiac dulness and of that of the liver. The level of the liver dulness need not be much altered, but there may be some lateral displacement of the heart to the left and a marked alteration in the right border of the cardiac dulness.

The explanation given by Grocco is based upon the anatomical factors.

It cannot be doubted that the mediastinum and its contents are more or less displaced into the sound chest, and thus exert some pressure upon the sound lung. Ferranini is of the opinion that the dulness is due to the pulmonary condensation caused by that visceral pressure. It is obvious, however, that the lower and broader part of the dulness is not due to any pressure from the heart or liver. I am, therefore, inclined to ascribe some of the dulness to a bulging of the more yielding prevertebral attachment of the posterior mediastinum, and of the distended pleura into the sound half of the thorax. This bulging would occur mainly below the level of the floor of the pericardium, where the prevertebral attachment is stronger, and it may entail a slight displacement of the œsophagus.

Grocco contends that the dulness which he has described is a safe test for the presence of pleural fluid, and that it affords a reliable estimate of its amount. Skiagraphy has established the fact that the level of the dulness corresponds with that of the fluid, but there does not seem to be sufficient proof that the dulness is due to the displacement and compression of the thoracic contents of the sound side.

Of the three papers which appeared during the past year on this subject, the most important is a report by Baduel and Siciliano<sup>1</sup> of experimental postmortem injections and dissections, as a substitute for the method of frozen sections, in a subject suffering from pleural effusion at the time of death. Their conclusions agree in every respect with those recently arrived at by my own clinical observations. The triangular dulness is produced by fluid only, whether pus or serum, and not by pulmonary consolidation or tumor, nor by plastic pleurisy. The essential change is the displacement of the posterior mediastinum, and this, as well as the cardiac displacement, is most marked when the effusion is on the right. The aorta is then pushed to the left of the bodies of the vertebræ; and this is a sufficient warning not to aspirate within the triangle. When the effusion is on the other side, the aorta is pushed from its left lateral into a median prevertebral position. The dulness is explained, not so much by the shifting of the heart and its appendages, as by the contact of fluid with a large section of the circumference of the vertebræ instead of the usual contact with inflated lung. This effectually deadens vibration in the vertebræ and in the ribs.

The shape of the prevertebral dulness is doubtless due to the fact pointed out by Baduel and Siciliano that at the base the pressure of the fluid acts on the walls of the pleura from the first and with progressive hydraulic force. The levels for their inspection of the visceral displacements were chosen at the second interspace and at the nipple only. We should note, moreover, that below the level of the heart, viz., below that

<sup>1</sup> Riv. Crit. di Clin. Med., January, 1904.

of the ninth spinous process, the pleural sinus is more capable of distention (at the expense of the intestinal gases), and that the range of lateral mobility of the posterior mediastinum is greatest between the loose pre-vertebral attachments of the floor of the pericardium and the fixed point of the aortic foramen. It is here, therefore, that the lateral bagging would be greatest, as, indeed, it is shown to be by the width of the base of the triangle. But it should be pointed out that the bag of fluid could not stretch so far across the spinal column as to occupy the opposite spinal groove. We are dealing, then, not with immediate dulness of fluid, but with a transmitted dulness; and an aspiration, if it should ever be undertaken, under a misapprehension within Grocco's triangle, would merely wound a healthy lung.

Percussion of the dorsal spines, which I have long practised habitually, is instructive in various practical directions, and, not least, perhaps, in a surgical direction. As regards the question of the signs of pleural effusion, I have found that unilateral effusion never confers absolute dulness upon the spine, but that double effusion always does render it dull.

Considerable light is thrown upon the causation of Damoiseau's curved line by the observation of Grocco. It might seem not only strange but contradictory that, whereas there exists a paravertebral dulness on the sound side, there should be found on the side of the effusion a relative paravertebral resonance for some distance below the upper level of the fluid. The explanation lies in the pleximetric function of the vertebræ. Partial contact with the collapsed lung renders them resonant in comparison with the dead dulness of the effusion, and partial contact with the bag of fluid damps their conducting power for vibrations, so as to render them dull as compared with the full resonance of the healthy side of the chest, over an area proportionate in extent to the broadening diameter of the collection.

In conclusion, the value of Grocco's sign is chiefly confirmatory, and it is somewhat limited by the fact that the dulness is least obvious in those cases where the effusion is not sufficiently large to ensure its own diagnosis. Moreover, it is more fully developed on one side than on the other. Nevertheless, it cannot fail to have its practical uses and should be kept under clinical study.

*Inequality of the Pupils* coincide with pleuritic effusions in a proportion of cases (7 out of 17) for some unexplained reason. We owe this observation to Chauffard and Laederich.<sup>1</sup> The inequality was slight and disappeared under the influence of positive accommodation or of a powerful light. It is probably the result of reflex dilatation on one side, possibly by inhibition of the light reflex. Souquers had previously described

<sup>1</sup> Arch. gén. de méd., March, 1905

inequality as a result of tuberculosis of the apex of the lung, and Vincent a narrowing of one pupil from phlegmonous angina.

*Wals' Sign of Intrathoracic Tumor* is brought to our notice again by M. Queirolo<sup>1</sup> at the Italian Congress in connection with a right pleural effusion in a woman, aged fifty-six years, suspected of tubercle. The two peculiar features which it presented included Wals' sign, namely, *increased measurement on the side free from effusion not due to previous deformity*, and hardly any displacement of the heart. The diagnosis of pleuropulmonary neoplasm, based upon this combination of signs, was verified after death.

*Valsalva's Experiment* has been used by Arthur Gröber, of Leipzig,<sup>2</sup> as a help in localizing intrathoracic disease. When the glottis is kept closed, and strenuous expiratory efforts are kept up, the jugular and superficial veins above and below the clavicle become turgid. Should, however, the patient be affected with unilateral disease of the upper intrathoracic region, the veins on that side will swell more and with greater rapidity than on the sound side. This test can easily be turned to account for the localization of the lesion on to the side affected. But it is clearly not one to be relied upon as conclusive, but merely as suggestive and confirmatory.

THE METHOD OF ESTIMATING THE AMOUNT OF A PLEURITIC EFFUSION, which is described by Orazio Schifone,<sup>3</sup> but was originally devised by Niclot and adapted by Achard, is an ingenious modification of the well-known physiological colorimetric method. 30 c.c. having been withdrawn by aspiration, 1 c.c. of a 2.5 per cent. methylene blue solution is injected through the same needle, and the patient is made to vary his position. Five minutes later 30 c.c. are again withdrawn and the depth of color compared with that of a litre of water previously mixed with 1 c.c. of the same standard blue solution. The degree of dilution of the methylene blue in the chest can then be calculated. Additional devices are suggested to obtain a more accurate estimate. Schifone, who has tested the method in a series of cases, has found it to work exceedingly well.

INOSCOPY, or Jousset's bacterioscopic method (1903), consists in collecting the bacilli in an exudate by coagulation, separating the clot and redissolving it by peptic digestion, and finally centrifugalizing the concentrated liquor. This has enabled him to find tubercle bacilli in 100 per cent. of pleurisies with effusion. P. S. Medovikoff,<sup>4</sup> who examined 6 cases, could find them only in half the number, or 50 per cent. Basilio

<sup>1</sup> Sem. méd., November 2, 1904, p. 352.

<sup>2</sup> Ibid., February 6, 1905.

<sup>3</sup> Rif. Med., November 16, 1904.

<sup>4</sup> Roussky Vrach., October 16, 1904.



Bonardi<sup>1</sup> has given the test a more extensive trial and believes that it will find a permanent place among our clinical methods. Nevertheless, he obtained positive results in 35 per cent. only of all cases, and the exudate failed to yield bacilli in cases where there existed multiple localizations of tubercle.

CYTODIAGNOSIS, which was elaborated by Widal and Ravaut in 1900 on the basis of the methods introduced by Ehrlich in 1880, is ably reviewed in an editorial,<sup>2</sup> which discusses some of its vicissitudes in connection with the study of pleural exudates and in particular with the recent contributions of Lewkowicz<sup>3</sup> and of Musgrave.<sup>4</sup> The latter has been able to confirm the original lymphocytic formula of the French observers in 22 out of 23 cases of primary tuberculosis of the pleura; the polynuclear formula, according to them, bearing the significance of a mixed or secondary infection with the ordinary pus formers, and endothelial formula denoting a simple transudate, or a traumatic effusion.

According to G. A. Gibson,<sup>5</sup> *a large and early lymphocytosis* in association with leucopenia suggests tubercle. Polynuclear neutrophiles and lymphocytes (the latter usually predominating) are found with a varying proportion of endothelia and blood cells with the help of centrifuge and of Jenner's stain. Of 118 cases of pleurisy, 65 were dry, 38 were serous, and 6 purulent; Koch's bacillus was found in 35 (29 per cent.); the pneumococcus in 27 (22 per cent.); and 34 cases did not reveal their etiology.

A painstaking examination of 41 cases of pleural effusion enables Herbert S. Carter<sup>6</sup> to draw attention to the complicating difficulties inherent to cytodagnosis. Specific gravity, proportion of fibrin and of albumin, body temperature, and their variations need to be taken into account, as well as the proportions and variations of the cytological elements. Although tubercle can be diagnosed when a high temperature coincides with a lymphocytosis, with a high specific gravity, 1012 to 1024, and with an abundance of fibrin and albumin, the fact that pleural transudates also presents a lymphocytosis precludes our relying upon mere cell counts for a safe diagnosis.

*The Cytology of Pleural Effusions* has recently been worked at also by Vargas-Suarez,<sup>7</sup> who enters largely into the question as to the origin of the lymphocytes. It is noteworthy that lymphocytes were in large excess in 15 idiopathic pleurisies, but almost absent in a tuberculous and in a rheumatic case which were examined by him.

<sup>1</sup> Gaz. degli Osped., July 24, 1904.

<sup>2</sup> Journal of the American Medical Association, November 12, 1904.

<sup>3</sup> Wiener klin. Woch., Bd. xvii., No. 37.

<sup>4</sup> Boston Medical and Surgical Journal, vol. cli., Nos. 12, 13, and 14.

<sup>5</sup> British Medical Journal, January 7, 1905.

<sup>6</sup> Medical News, October 1, 1904.

<sup>7</sup> Beiträge zur klinik. der Tuberculose, 1904, Bd. ii., 201.

THE TREATMENT OF PLEURISY AND OF THE EFFUSION. Important discussions have been held on this large subject, particularly with reference to effusion. Immobilization of the side affected, for which Lankester<sup>1</sup> recommends long strips (two inches wide) of oxide of zinc plaster in preference to the old rubber adhesive plaster, because it sets up little or no erythema, is, as well as the bleeding which he also recommends, exclusively applicable to the non-exudative form or to the dry stage. Although a strong case can be made out in favor of immobilization in the tuberculous variety, in connection with the accepted precept of "rest for tubercle," clinical instinct prompts one in early cases to choose the lesser evil, and to keep the visceral pleura moving, though this may slightly prolong the pyrexial stage, with the excuse that the affection may be said to invariably recover, and that any reasonable risk ought to be taken which can obviate the formation or the tightening up of adhesions. In the frankly rheumatic case there can be no hesitation in abstaining from a device which is as troublesome as it is unnecessary. Local leeching is the best remedy for this pain, and for the disease itself; and there are other topical anodynes, such as local heat, ~~heat~~ <sup>ice</sup> ~~ice~~ <sup>medicated</sup> applications, and posture itself, to say nothing of the simplest of all pain killers, a hypodermic injection of morphine, to tide over the few hours' interval before effusion gives relief, or our antiphlogistic measures have taken effect.

The discussion at the Oxford Meeting of the British Medical Association did not elicit much novelty, but a good representation of prevalent practice. *Early withdrawal of the fluid*, if necessary to be repeated, not as an adjunct, but as an essential of treatment, and careful after-treatment in view of the risk of latent tuberculization; these are requisites, duly insisted upon by Osler, which are emphatically to be endorsed. I cannot feel sure that pneumothorax is so rare after thoracentesis as he seems to believe. Probably it is often overlooked because not looked for, and because it is not apt to set up any symptoms so long as the patient lies quiet. I have witnessed it repeatedly of late. The fact that it does occur, and this has also been noted by Schlesinger<sup>2</sup> in his thorough discussion of the treatment of effusion, is an argument in favor of the adoption of Forlanini's method of evacuation, the advantages of which were dwelt upon in last September's volume of PROGRESSIVE MEDICINE.

The same report also refers to J. Barr's *intrapleural injections of adrenalin solution* after paracentesis.

*For Delaying Thoracentesis*, at least in the case of children, we have the well-known inducement that in them effusions are very often quickly

<sup>1</sup> St. Paul Medical Journal, July, 1904.

<sup>2</sup> Medical Press, March 15, 1905, p. 273.

reabsorbed, as stated by T. D. Acland; and the further excuse that their lungs will readily re-expand, even after persistent compression. The transient character of the "Ephemeral Pericardial Effusions," which I have described, is an analogous instance; and effusions in the peritoneum and in the subarachnoid and ventricular spaces furnish us with further object lessons for delay. Nevertheless, my present feeling is that, in presence of the fact that in the case of thoracentesis, the attendant risk is almost *nil*, the encumbrance of an unhealthy fluid should be removed, unless it can be shown that the slow reabsorption of a quantity of "materia peccans" can serve prophylaxis or promote immunity. Delafield's<sup>1</sup> statistical study of the after-history of tapped pleurisy and of those not tapped is well worth extending by others, with a view to further confirming his advocacy of early paracentesis.

*Gilbert's Method of Auto-serum Therapy in Pleuritic Effusion*, which has been tried in a series of cases by Michele Landolfi,<sup>2</sup> appears to have had a precursor in an analogous method applied by Debove and Rémond in tuberculous peritonitis. The ease and harmlessness of the procedure, which consists in withdrawing a small amount of the fluid from the patient's chest and injecting it into his circulation, are recommendations of a negative kind; and it is difficult to think that the injection of this fluid into the blood can have any beneficial effect whatever. Still, Landolfi believes that the method may arrest the tuberculous process or prevent recurrence, and that it should be used in all cases of pleurisy with effusion.

*Re-expansion of the Collapsed Lung* by the early adoption of respiratory exercises was insisted upon by Osler.<sup>3</sup> The same end can be promoted by posture, the patient being placed on his sound side immediately after tapping, in order to bring the other lung into action. This was part of the systematic after-treatment of pleural effusion which I described some years ago before the London Polyclinic. Open-air treatment is, of course, indispensable in all cases due to tubercle. For the diagnosis of the rheumatic variety, G. A. Gibson recommends that the urine should be examined for the presence of the diplococcus of rheumatism. He has found treatment by tuberculin to be useful in some cases.

*The Usefulness of Medication* is but faintly believed in by Osler and not at all by R. W. Philip. But we can hardly afford to indulge in skepticism, in face of some of the achievements of mercury in tuberculous peritonitis and in various forms of arthritis, and of the salicylates and of diuretics in rheumatic effusions. Our rapid methods seem to have made us less thankful for smaller mercies. But it is worth noting that the

<sup>1</sup> American Journal of the Medical Sciences, December, 1902.

<sup>2</sup> Rif. Med., July 27, 1904.

<sup>3</sup> Loc. cit.

value of salicylates in the treatment of pleurisy with effusion is dwelt upon by Le Waschew<sup>1</sup> among other advocates.

*The Merits of the Chlorides and of Clinical Dechloridation* have not yet been satisfactorily determined. We are in danger of being confused as to the main points by the multitude of side issues which have been raised in connection with more or less strictly scientific observations. But Chauffard and Bodin's observations in the treatment of pleuritic effusion lead them to recommend a strict milk diet, because it not only excites diuresis, but promotes the "chloride crisis," or increased urinary excretion of chlorides which is associated with the natural process of resorption of the effusion. During that period any additional chlorides in the diet are not retained as at the height of the exudative process, favoring œdema and venous stasis, but pass out freely.

**Chylothorax.** A case of milky effusion into the left pleural cavity is reported by P. I. Kozlefsky. The patient, a young lad, had two attacks of syphilitic hemiplegia. The effusion, which occurred after removal of 2000 c.c. (the patient dying after leaving the hospital), may, therefore, have been due to syphilitic intrathoracic disease.

*Traumatic Chylothorax* is the theme of two interesting papers. A. Dietze<sup>2</sup> adds to 9 cases which he has collected from the literature, a tenth case, the first of the reported cases caused by a bullet wound. Right-sided effusion was recognized on the sixth day, though dyspnœa had begun on the third. The chest was tapped on the tenth day, 1500 c.c. being withdrawn, and again 2350 c.c. on the fourteenth day; and six further aspirations within seventeen days removed a total of 19,400 c.c. But only two more aspirations at longer intervals were necessary. Dietze advises this, as direct suction is exerted by aspiration, the operation should always be delayed as long as the urgency of dyspnœa will permit. But in cases of rapid reaccumulation, thoracotomy with costal resection would do away with the suction and encourage healing.

F. Munch<sup>3</sup> endorses tentatively the same suggestions after discussing the symptoms. The simpler and less severe proceeding which I would venture to suggest, at any rate for trial, in all cases of this kind, is a resort to Forlanini's principle of substituting air for fluid, with the essential modification that the chest should not be emptied by aspiration, but by siphonage, a separate cannula being introduced for the supply of aseptic air.

In the case of an infant of eighteen months reported by M. N. Filippov,<sup>4</sup> probably the youngest case on record, thoracotomy was followed by the

<sup>1</sup> Wiener med. Presse, 1904, Nos. 37 et 38.

<sup>2</sup> Deutsche Zeitschrift f. Chir., June, 1904.

<sup>3</sup> Semaine méd., August 10, 1904.

<sup>4</sup> Prakt. Vrach, September 18, 1904; Semaine méd., November 2, 1904

usual series of reaccumulations and by death from exhaustion. Had air been introduced into the pleura, the result might, perhaps, have been less disastrous.

**Pneumothorax.** *Traumatic Pneumothorax from Thoracentesis* is, as already stated, not an infrequent result in my experience, confirmed by that of Schlesinger. A puncture is inflicted upon a collapsed lung; and the next event is forcible expansion of the latter by aspiration. The resulting pneumothorax would probably be more often detected if the chest were examined at once. The condition rapidly cures itself, but it would more easily be avoided if siphonage were used instead of aspiration, and the outer air admitted into the chest.

*The Production of Pneumothorax is no Objection to*, but part of the technique of various thoracic operations or explorations. Cavazanni<sup>1</sup> has used it systematically to obtain better access to pulmonary abscesses or gangrene.

*The Treatment of Pyopneumothorax* formulated long ago by Samuel West<sup>2</sup> is now restated by him as follows: 1. Early stage: Deflation by paracentesis (never by aspiration, which West considers to be dangerous in pneumothorax), to be repeated, if required; and failing relief, pleurotomy, if there should be any urgent indication. 2. Later stage: Tentative tapping, to ascertain the nature of the fluid. If this should be serous, the treatment should be framed on the same plan as that of serous pleurisy; if purulent, the chest should be at once incised and drained, without resection of ribs, unless found to be indispensable.

For urgent cases too ill to submit to the risks of anæsthesia, William Turner<sup>3</sup> recommends in preference to aspiration the introduction of a trocar and cannula under local anæsthesia. The complete operation for empyema, including rib resection, can then be delayed for a few days, and meanwhile the advantage of drainage is secured.

**The Diaphragm.** CONGENITAL DIAPHRAGMATIC HERNIA, AS WELL AS THE ACQUIRED VARIETY (including the traumatic), is considered by R. L. Knaggs<sup>4</sup> more especially in connection with volvulus of the stomach, which is apt to arise from torsion of the small omentum. Among the physical signs which may suggest the presence of this condition, he mentions (a) rumbling noises in the chest due to stomach or bowel, (b) peristaltic movements perceptible through the intercostal spaces, (c) lateral displacement of the heart, (d) suppression of the breath sounds, (e) unilateral alteration in shape and deficiency of movement of the thorax, (f) inability to lie on the sound side, (g) depression of the epigastrium, and (h) distention of the stomach, sometimes to an extreme degree.

<sup>1</sup> *Rif. Med.*, 1904, Bd. xx.

<sup>2</sup> *Lancet*, October 22, 1904.

<sup>3</sup> *Ibid.*, April 15, 1905.

<sup>4</sup> *Ibid.*, August 6, 1904.

**TRAUMATIC HERNIA THROUGH THE DIAPHRAGM.** In the man seen by H. B. G. Newham<sup>1</sup> soon after a fall of thirty feet, which had caused extensive bruising, but no thoracic fracture, the stomach and part of the colon occupied the left half of the thorax, displacing the heart to the right. The tear in the diaphragm was supposed to have been produced by sudden and violent muscular contraction. The patient survived two days, in spite of much precordial and subsequent abdominal pain.

## THE LUNGS.

**Physical Signs and Physical Methods of Examination.** CLINICAL DERMOGRAPHY is much facilitated by Stacy Wilson's<sup>2</sup> device of rubbing on the skin a little zinc oxide, such as is used as a hospital dusting powder. This enables the skin to receive from silver, German silver, and similar metals, a good, dark impression. Skin so treated can be easily and darkly marked by a silver coin. This reaction of the skin might chance to be mistaken in the case of paralyzed limbs for a trophic change due to the paralysis.

**PERCUSSION.** *Immediate Percussion of the Chest with One Finger*, recently practised with gratifying success by Ernesto Caccianiga,<sup>3</sup> is the final type of irreducible simplicity, which would long ago have been universally adopted, but for the complicating factors of varying tenderness in the percussed, and varying lightness of hand in the percussor. These are eliminated when percussion is performed not from the wrist, but from the proximal finger-joint. It is then strictly a "finger percussion." I can confirm Caccianiga's favorable account of this method, which I have long employed, but only over the subcutaneous bony surfaces, and without excluding wrist movement. I have also learned that one finger is better than two. Inasmuch as precision in delimitation is proportionate to the lightness of the blow, this is of all methods that likely to provide most rapidly a helpless percussor, not only with fine results, but with the first essential in the technique, viz., a stroke so gentle that the most delicate patient will not resent it.

Immediate percussion is also practised by M. A. Fränkel,<sup>4</sup> only not with the finger, but with a small hammer.

**AUSCULTATION.** *An Elementary Appreciation of Pitch* is indispensable to efficient auscultation, even more than to percussion, which elicits the tactile vibrations, as well as the sonorous. A. J. Steven's<sup>5</sup> letter and Quimby's<sup>6</sup> paper, to which it refers, both reflect the confusion which has

<sup>1</sup> Lancet, December 24, 1904.

<sup>2</sup> British Medical Journal, March 5, 1905.

<sup>3</sup> Gazz. degli Osp., October 23, 1904.

<sup>4</sup> Sem. mèd., January 18, 1905.

<sup>5</sup> Journal of the American Medical Association, November 26, 1904, p. 1629.

<sup>6</sup> Ibid., October 1, 1904.

resulted from individual inadequacies in the appreciation of sounds, and from the ill-tutored use of acoustic terms. Is the inspiratory pitch or is the expiratory pitch the higher of the two? That is the question. Its discussion would occupy too much space here, but it may be of use to point out that high harmonics are better perceived by some than lower sounds, and that to those ears, if not exceedingly attentive, the lower ground tones might thus appear to possess the higher pitch.

*The Reverberator* suggested by Stacy Wilson<sup>1</sup> for the easier detection of the "Bell Sound" in chest or abdomen is essentially the same as Reichmann's rod, viz., a short cylindrical bone rod, about one and a half inches long and three-eighths of an inch in diameter; its lower end rounded for close apposition to the surface; the upper end flat and roughened, so that loud and regular vibrations can be set up by scratching. The area of the subjacent viscus can be very sharply defined. Much information can be gained if the scratching be kept up continuously. In ascites with distended stomach, the pitch of the reverberation rises with each inspiration and falls with each expiration, owing to the varying tension of the gas. Of still greater use is the change in the pitch of the note, which results from the peristaltic action of the viscus concerned; for instance, in the stomach, as the wave of contraction passes from cardia to pylorus. Useful information can often be gained by the same method in intestinal obstruction.

PHYSICAL SIGNS IN INFANTS AND CHILDREN. Samuel McC. Hamill and Theodore Le Boutillier<sup>2</sup> call attention to certain normal conditions usually overlooked in pulmonary percussion and auscultation.

1. *An Area of Impaired Resonance under the Inner Third of the Left Clavicle* was first noted accidentally; but on investigation it was found by them to be the rule in healthy children up to the age of nine or ten years, or even later, though varying in its degree, and also in its extension beyond the first interspace, sometimes as far as the cardiac dulness. The only explanation which they could find seems to be a probable one, viz., the relatively exposed condition of the great vessels in the manubrial region, particularly to the left of the middle line. As the chest becomes deeper and the lungs more bulky with advancing growth and muscular development, the difference between the two sides becomes less marked. The existence of a prevascular dulness above the precordial dulness was pointed out many years ago by the present writer in his "Cardiac Outlines," and also its want of symmetry and its extension to the left. The accentuation of this asymmetry in juvenile chests is an important addition to practical semeiology.

<sup>1</sup> British Medical Journal, March 25, 1905.

<sup>2</sup> Journal of the American Medical Association, January 7, 1905.

2. *The Variability of the Normal Area of Transmission of Bronchial Breathing* beyond its usual site at the interscapular and supraspinous regions, and its extension in some children to the entire scapular and even to the lower axillary region is another practical matter not to be overlooked. Posture and pressure may have much to do with the abnormality in question.

3. *The Influence of Position* is also great in modifying the percussion note in infants. Lateral decubitus is apt to mislead by its tendency to raise the pitch of the percussion note in the dependent lung partly compressed, and no longer served by the elasticity of the chest wall.

**PALPATION.** *Vocal Fremitus.* If, as William N. Berkeley<sup>1</sup> contends, this has been neglected in recent clinical work, it should be again made prominent in our teaching. It is of special educational value to the student in the most important of all his physical-sign training, that of palpation. For that reason, I would venture the suggestion that not only the four fingers of the best trained hand, but the palm also, and particularly the highly discriminating *ulnar pad*, so convenient to use edgewise for accurate localization, should be applied to the chest, and that the student should have the perseverance to practice bimanual palpation (crossed hands being used as a check) until either hand has become "the best hand."

*The Use of the Tuning Fork*, so often suggested in auscultation, is again proposed as an aid in diagnosis by Chiret and Mores<sup>2</sup> for the earlier detection of osteoarticular affections, and might, therefore, find its application in suspected disease of the thoracic vertebræ. While sound bone is almost insensitive to the vibrations of a large tuning fork (25 cm. in length), they produce shaking, trembling, electric or burning sensations in diseased bones.

**INSPECTION.** *The Phrenic Wave.* The practical value of Litten's "diaphragm phenomenon" in diagnosis has found a staunch advocate in William N. Berkeley.<sup>3</sup> As regards the name, it is impossible not to agree with his contention that "phrenic wave" is shorter and more descriptive, and that it may be justifiable to speak of Litten's "wave," although the "shadow" which is given by the wave was originally introduced to our notice. The wave seen to travel up and down the lower intercostal spaces in lean and active breathers is an ocular demonstration of the movements of the lower fringe of the lung and of the anterior surface of the diaphragm. Berkeley points out that its marked diminution in front on both sides, together with its marked persistence behind, is characteristic of emphysema and of asthma. But the best clinical value is found in its unilateral

<sup>1</sup> Medical News, May 28, 1904.

<sup>2</sup> Presse méd., 1904, Bd. i., No. 47.

<sup>3</sup> New York Medical Journal, February 4, 1905.



variations. Its complete or almost complete absence on one side only may afford valuable confirmation to other signs of various unilateral affections, such as pleurisy or tuberculous disease, which is so apt to lessen the excursion of the diaphragm and other conditions. The absence of a visible phrenic wave on both sides cannot be used as a basis for any clinical conclusions, unless the subject had previously presented good waves.

On the other hand, the study of Litten's phenomenon is an excellent exercise for the student. It also has much value for the physiologist, who possesses in it an automatic and truly scientific record of the normal movements of the diaphragm and of the base of the lung, absolutely free from any adulteration or experimental error. In life insurance examinations the phrenic wave may acquire considerable importance. The vertical range of pulmonary expansion is a test not less telling than the horizontal or circumferential range, and this the phrenic wave may supply without the expense or trouble of *x-ray* examinations. A wave excursion of not less than three inches on both sides would be a sufficient proof of pulmonary health and efficiency.

*Dissociated Respiration* is the felicitous term applied by P. Grocco,<sup>1</sup> of Florence, to the altered combination of thoracic and abdominal breathing. Loss of their strict physiological co-ordination is specially frequent in medullary and cerebral lesions and affections, and in severe diseases and toxæmiæ.

## THE BRONCHI.

"**The Nursing Bottle to Arrest Coughing,**" recommended by Rahn in the *Correspondenzblatt*, sounds like a trivial remedy for a minor ailment. Its scope and its importance are in reality considerable. In all serious states threatening to impair the function of swallowing the feeding bottle is a help and facilitates and regulates deglutition, and lessens the risk of inhalation pneumonia. I have found a good substitute for it in an india-rubber tubing of very small bore and great thickness attached to the spout of the feeder, so as to ensure slow delivery of fluid without any risk of kinking or compression by the teeth.

**Fibrinous Bronchitis** varies much in type and in the severity of its symptoms. It probably varies also in its pathology. This diversity is well brought out by G. Liebermeister's<sup>2</sup> study of the composition of the casts obtained from a series of cases besides the cases which he contributes. Purely mucous casts are familiar objects. But within the "fibrinous"

<sup>1</sup> Rif. Med., xx., No. 24, 1904.

<sup>2</sup> Deutsche Arch. f. klin. Med., vol. lxxx. p. 551.

category must be included not only purely fibrinous casts, but also those in which both constituents are variously combined.

The treatment suggested by Moser<sup>1</sup> for an acute suffocative attack includes the inhalation of oxygen, steam inhalation, codeine, and creosote. The latter is, in his opinion, of much value during the intervals. The most rapid results are probably to be expected from intratracheal methods; but these are not free from risks and need technical experience as well as judgment. Iodide of potassium is probably the best of our internal remedies.

In an unusual case of *Relapsing Pneumococcus Fibrinous Bronchitis* in a child reported by Ménétrier,<sup>2</sup> the first attack lasting three months, began eight days after birth, a second attack of the same duration at four months, and a third, which was apparently shortened by iodide of potassium and creosote, at the age of two years.

**Pneumococcal Bronchiolitis**, described by C. P. Clark and F. H. Batman<sup>3</sup> in a man, aged twenty-one years, whose lungs presented very little implication of the alveoli, and none of the large tubes, but whose bronchioles were all affected in both lungs, must presumably be classed as an intermediate form between lobar pneumonia and the "primary bronchopneumonia" of Samuel West. The clinical diagnosis had been "pneumonia, probably with miliary tuberculosis."

**Primary Pneumococcus Bronchopneumonia** is held by Samuel West<sup>4</sup> to be of frequent occurrence in infancy and early childhood, a view in which J. A. Coutts<sup>5</sup> cannot agree. P. Stanley Blaker<sup>6</sup> takes up an intermediate position in regarding primary bronchopneumonia as almost limited to the first twelvemonth. Secondary bronchopneumonia and the croupous variety as more common afterward. Lobar pneumonia then becomes the more common of the two affections; but in cases dying after seven or ten days secondary bronchopneumonic patches are usually found, and their presence may account for the divergent opinions expressed. General clinical experience will probably agree with my own that the pneumococcus bronchopneumonia brought to our notice by West was previously misunderstood, and will be in the future recognized as frequent; West says "very frequent." In his own words, "acute pneumococcal inflammation of the lungs tends in the child to take the patchy or disseminated form, and thus to be confused with ordinary bronchopneumonia."

The terms *suffocative catarrh* and *acute congestive bronchopneumonia* have been misapplied, according to West,<sup>7</sup> and great confusion has been

<sup>1</sup> Medical Record, August 6, 1905.

<sup>2</sup> Soc. méd. des hôp. de Paris, December 9, 1904.

<sup>3</sup> Journal of Infectious Diseases, Chicago, March 19, 1904.

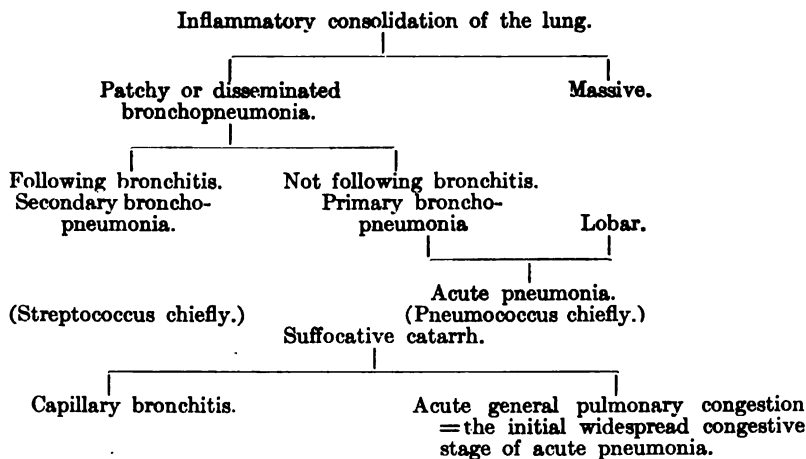
<sup>4</sup> British Medical Journal, October 8, 1904.

<sup>5</sup> Ibid., October 29, 1904.

<sup>6</sup> Ibid., November 25, 1904.

<sup>7</sup> Ibid., December 3, 1904.

the result. True "suffocative catarrh" is bronchiolitis or capillary bronchitis. "Acute pulmonary congestion," sudden and fatal in a few hours, is pneumonia at its earliest stage, and clinically as well as pathologically distinct. In view of the importance of this subject and of the prevailing uncertainty as to the meaning of our terms, West's tabulated classification will be a help:



THE TREATMENT OF BRONCHOPNEUMONIA IN CHILDREN, as laid down by W. P. Northrup,<sup>1</sup> is a resultant of hygiene and common sense; fresh air and water; no antipyretics; hot foot-baths and hot salines; whiskey and strychnine as heart stimulants; add no other drugs. To these might perhaps be added another good old remedy, recently again recommended by J. Pinto,<sup>2</sup> the cold compress frequently renewed.

**Pulmonary Congestion as a Cause of Sudden Death** has not received much recognition of late years from clinical authorities. W. W. Miner,<sup>3</sup> who reports 3 cases, partly bases his views as to their etiology upon the statement that horses frequently die of this affection. I have never witnessed this occurrence in the midst of perfect health, apart from the action of poisons; but of the occasional supervention of acute pulmonary congestion in early renal disease I have no doubt. It is not improbable that a bacteriological examination would identify most of these fulminant cases as instances of acute pneumococcus congestion.

**Asthma.** THE TRACHEAL TRACTION TEST is described by A. Abrams<sup>4</sup> as an aid in the recognition of the "idiopathic" bronchial asthma, for this is the only condition in which extension of the trachea, by raising the chin high, fails to induce a definite change in the percussion note of the manu-

<sup>1</sup> Medical News, April 30, 1904.

<sup>2</sup> Brazil Medico, xviii., No. 1.

<sup>3</sup> Boston Medical and Surgical Journal, December 22, 1904.

<sup>4</sup> Medical News, June 25, 1904.

brium. When the chin is bent upon the sternum the note is always resonant; when the neck is extended the note becomes in all subjects less resonant or even dull, even in the presence of pulmonary disease. Abrams considers that this is due to a reflex contraction of the bronchial muscle and to the resulting tension of the air in the trachea and bronchi. But in idiopathic asthma there is no change; and Abrams concludes that the tonicity of the bronchial muscle is so much reduced that it no longer responds to stimulation of the vagus. A simpler explanation might suit the facts stated by Abrams. Except with the closed glottis no rise in air tension could take place. As a fact, if percussion be applied to the trachea itself or even to the larynx, the same changes of pitch will be obtained. Supposing the rise in pitch were due to the increased tension of the tracheal membrane itself, just as stretching the membrane raises the pitch of a drum, then no rise would be expected where the cartilaginous rings had already been drawn taut, and this must be the case in the asthma paroxysm if it is a fact that the bronchial muscle is then in a state of tonic contraction.

FOR THE TREATMENT OF ASTHMA, Bahadurja<sup>1</sup> reports excellent results from three daily doses of 5 minims of adrenalin solution continued for one to three months. W. F. Wagner<sup>2</sup> has been able to relieve the paroxysms, although not to cure the disease, by a subcutaneous injection (sometimes repeated in a few hours) of from 2 to 10 drops of the solution of adrenalin. The editor's comment in the *Therapeutic Gazette* upon the risks of this mode of treatment I can endorse. The pulse is tense during the paroxysm, and any additional tension may be too much for the wearied heart.

In the discussion on Greville Macdonald's paper,<sup>3</sup> who believes that in a few years "every general practitioner will use the cautery" for asthma, not a few speakers declared that the method had not been successful in some of the cases, and Samuel West dwelt upon the analogy between the epileptic and the asthmatic predisposition, which is open to irritations capable of arising from various parts of the body. Though relief may be given, this circumstance greatly limits the prospects of a cure.

In view of the "unreckonable individual factor" in connection with the action of climate, G. Avellis<sup>4</sup> considers that the best climate may perhaps be found in a sanatorium under enlightened management, for the sake of the regulation of the nerves and of the nervous system, and of another factor, the importance of which cannot be gainsaid, that of therapeutic suggestion.

<sup>1</sup> Indian Medical Gazette, December, 1904; *Therapeutic Gazette*, 1905, p. 97.

<sup>2</sup> Journal of the American Medical Association, February 11, 1903, p. 498.

<sup>3</sup> British Medical Journal, November 5, 1904.

<sup>4</sup> Münch. med. Woch., November 15, 1904, Bd. li., No. 46.

In a letter to the *Therapeutic Gazette* (p. 216, 1905), Francis Hare reminds us of the view which he has published<sup>1</sup> long ago, that asthma is one of a long series of closely allied vasomotor neuroses, and that cauterization of the nasal mucosa might be expected, as now shown by Alexander Francis and by W. N. Robertson, to have much wider potentialities than the relief of the one neurosis only. They have found it to be of value in some cases of angina pectoris and of epilepsy, and in one case of migraine. In this connection, it is interesting to note that G. Kolischer<sup>2</sup> has failed to be convinced of the reality of so-called "nasal dysmenorrhœa," and has been disappointed in the results of the "Fliess treatment."

In *Infantile Asthma*, La Fétra<sup>3</sup> has had good results from small and repeated doses of a mixture of tartarated antimony, epecacuanha, and nitroglycerin. He has also given successfully  $\frac{1}{2000}$  of a grain of atropine every two hours until the face becomes flushed (this usually occurs after two or three doses).

### THE PERICARDIUM.

The Treatment of Acute Pericarditis, when complicated by effusion, often calls for special experience, both in the physician and the surgeon, which it is not easy to command, as the affection is not so common as to be always available for study. H. Edwin Lewis<sup>4</sup> gives large and repeated doses of saturated solution of Epsom salts in preference to antirheumatics or tonics and stimulants, unless these should be indispensable. Dry cupping or counterirritation are useful for the pain, and rest in "as prone a position as possible" is recommended.

THE TREATMENT OF THE EFFUSION would be a perplexity, but for two circumstances: the usually prevailing rapidity of spontaneous reabsorption, and the want which is still felt of a truly satisfactory surgical procedure. Were the latter absolutely simple and without risk, who would delay giving immediate relief to an oppressed heart? Punctures are not safe or reliable, incision is apt to grow into a larger operation than originally contemplated, or, indeed, required. Our hand may be forced by the urgency of the dyspnoea, a contingency more habitual in the uræmic than in the rheumatic conditions. Perhaps in the latter the prolonged distention of the pericardium, with assured protection from adhesions, is a less evil than irritation by rough friction of an acutely congested membrane pouring out fibrin and too readily blood

<sup>1</sup> The Mechanism of the Paroxysmal Neuroses, Australasian Medical Gazette, 1893.

<sup>2</sup> American Journal of Obstetrics, June, 1904.

<sup>3</sup> Arch. of Pediatrics; Journal American Medical Association, January 14, 1905.

<sup>4</sup> Medical Record, September 24, 1904.

also, with the prospect of agglutination. The pericardium is in all respects *sui generis* among serous membranes, and does not lend itself to conclusions from analogy. To some extent we can govern the movements of the lung; those of the heart are beyond our control, and there is no rest for them. We should not forget, too, that a pressure so evenly applied as is hydraulic pressure gives some support to vessels inclined to active dilatation. These are some of the considerations that mitigate our regret in our doubts and ignorance. A more useful solace is the exercise of our protecting power against the major evil of hyperfibrinosis. Salicylates are depressing and must be avoided or handled lightly; but there is no risk and great advantage in diaphoretics and in the administration of the citrates and of potassium iodide. The strength of the heart must be kept up without interfering with its rhythm. In this respect, strychnine and other supporting tonics may be preferred to digitalis, though very small doses of the latter would probably do good. Much remains to be learned before we can boast of being able to check or forestall the occurrence of rheumatic agglutination, which is often more disastrous than the valvulitis due to the same infection.

**PERICARDIOCENTESIS.** The fallacy that the heart sinks in an accumulation of pericardial fluid is difficult to root up from clinical literature. It is again alleged in a paper by Doeber, <sup>1</sup> in support of his recommendation—a good one in itself—to keep the patient's head and chest raised during exploration “to prevent the fluid from gravitating back.” To expose this misconception in the postmortem room, it is only necessary to take a cupful of blood, which is much heavier than serum, and to drop into it a child's heart ligatured with its contents. *Of course, the heart will sink.* Doeber rather favors a right-sided puncture.

**Uncomplicated Tuberculous Pericarditis**, as a single isolated manifestation of tubercle, has rarely been reported, only seven times, according to G. Scaglios. <sup>2</sup> His one case was that of a woman, aged sixty years, who died of pyelonephritis. None of the organs and tissues examined microscopically presented any tubercles, except the pericardium, where they were well marked.

**Pneumopericardium** is almost a rarity in our clinics, since Walter B. James <sup>3</sup> can only find 37 well-reported cases anterior to that which he relates. It is not difficult to diagnose, as it is loudly forced upon our notice by the extraordinary “churning sound” (Meigs), well known also as the “water-wheel sound,” “bruit de moulin à eau,” “bruit de la roue hydraulique,” etc. In its perfect production it is quite diagnostic; but it may be partly imitated by the occasionally reported “heart's action

<sup>1</sup> Berliner klin. Woch., May 2, 1904.

<sup>2</sup> Deutsche med. Woch., 1904, Bd. xxx.

<sup>3</sup> American Medicine, July 2, 1904.

splash" in cases of pneumothorax. James furnishes a tabulated list of cases. Among 11 patients who recovered, 4 had stab wounds, and 4 no external perforating wound, and, therefore, probably some internal injury from the fall, blow, or crush reported.

**Pericarditic Pseudocirrhosis of the Liver.** The chief contribution to this subject is from F. Schupfer.<sup>1</sup> He distinguishes two clinical groups among the bearers of pericardial adhesions, "the asystolic" and "the pseudocirrhotic." The former has slight ascites and general oedema, the latter great and recurrent ascites and no general oedema. The severity of the ascites is the outcome, not of cardiac alcoholic, syphilitic, or other cirrhoses, but of chronic peritonitis. That is the primary cause of the ascites, coupled with changes in the centrum tenebrum. The existing pericarditis predisposes to ascites in the degree of its weakening effect upon the circulation. The pleuræ, especially the right, may also suffer effusion; but "polyseritis" is the exception. Thus a cirrhosis might possibly be present and yet not be truly responsible for the ascites. The existence of "Anascitic Cirrhosis of the Liver," recently brought up again under this new title, proves this point.

## THE HEART.

**The Estimation of the Functional Capacity of the Heart.** The inherent fault of most of the tests which have been proposed for the estimation of the functional capacity of the heart resides, as pointed out by George W. Norris,<sup>2</sup> in the fact that no allowance is made for psychic and for the visceral effects, the importance of which cannot be denied. This defect also attaches to Graupner's method, which is based upon a determination of the reaction of the pulse, of the blood pressure, and of the size of the heart to the performance of a measured amount of work.

**HERZ'S ARM-FLEXION TEST.** A very simple manœuvre has recently been proposed by M. Herz<sup>3</sup> for ascertaining the functional integrity of the heart. The patient's right elbow is supported upon the observer's hand, while the other hand lightly grasps his wrist. The patient is then requested to concentrate his attention upon the performance of a very slow and uniform flexion of the forearm, which should not be resisted by the observer, but carried out by the patient with the least possible effort, and this is to be followed by an equally slow and gradual extension. The pulse which had previously been counted is again counted immediately after the extension. If the patient's myocardium is not absolutely sound

<sup>1</sup> *Rif. Med.*, March 2, 1904.

<sup>2</sup> *Medical Notes and Queries*, January, 1905, p. 9.

<sup>3</sup> *Deutsche med. Woch.*, February 9, 1905.

a marked difference will be noted, in the shape of a slowing of the rate and of an increase in the size and the strength of the pulse wave; whereas, the pulse of a perfectly healthy subject will only present a very slight acceleration and no other change. Herz's interpretation of this reaction calls to aid a reflex starting from the cerebral zone of attention and reaching the heart through the medulla and the vagus. The undue excitability of weakness is revealed in the response of the latter to a trifling stimulus, just as this happens in the case of a dose of digitalis of which the normal heart takes no notice whatever. Whatever eventually may prove to be the practical value of this test, its simplicity is a recommendation.

**A Direct Registration of the Heart Sounds** has been attempted by O. Frank<sup>1</sup> by means of a tambour and of photography. The description of this ingenious contrivance should be read in the original.

**FIRST SOUND REDUPLICATION HEARD CLOSE TO THE APEX** as distinct from the "bruit de galop" is regarded by M. Labougle<sup>2</sup> as an early sign of cardiac fatigue. Its distinctive features are its variability, its unaccountable disappearance at times, and its marked dependence upon posture, for it is apt to be temporarily suppressed by dorsal recumbency. It is an evidence of asthenia rather than of disease.

**Heart Murmurs. THE DIASTOLIC MURMUR IN DIAGNOSIS.** The chief conditions under which we expect to hear a diastolic murmur are aortic and pulmonary insufficiency, persistent ductus arteriosus, aneurysm, mitral stenosis, pericardial and pleuropericardial complications, and cardiorespiratory influences.

In respect to diagnosis this is the most important of all murmurs, but it happens to be that most apt to elude the stethoscope. It is well that Austin W. Hollis<sup>3</sup> should have entered fully into the study of its diagnosis. I find it a golden rule never to pronounce a doubtful second sound free from aortic regurgitation before using the rigid stethoscope.

**THE MECHANISM OF THE AORTIC VALVES IN HEALTH AND IN DISEASE.** A useful method has been adopted by R. G. Ewart,<sup>4</sup> of Manchester. He has constructed a scheme of the aortic valves with the help of a glass box, through which a stream of blood can be passed between the valves, while any resulting eddies and any sounds produced can be noted. He finds that, in cases of serious valvular destruction, varying motions occur behind and in the neighborhood of the damaged cusps, which materially assist in lessening the regurgitant effect of the valve deficiency.

**PULMONARY REGURGITATION.** *The Diastolic Murmur of High Tension in the Pulmonary Artery*, described by Graham Steele in 1881, and

<sup>1</sup> Munch. med. Woch., Bd. li., No. 22.

<sup>2</sup> Medical News, May, 1904.

<sup>3</sup> Sem. méd., April 26, 1905.

<sup>4</sup> Lancet, November 26, 1904.



elaborately presented for our recognition by Bryant in *Guy's Hospital Reports*, vol. lv. p. 81, is the subject of a lecture by H. Batty Shaw,<sup>1</sup> who is also a believer in its prevalence. It might be expected to occur with great frequency in cases of mitral stenosis, and, according to the latter author, it does occur in them, but is apt to be overlooked, or if recognized, to be mistaken for an aortic regurgitant murmur. This, we all know, possesses the same area of audibility to the left of the sternum; while there are no known physical signs or symptoms special to pulmonary regurgitation. He thinks that many a case has been diagnosed as one of aortic regurgitation with a secondary Flint's murmur at the apex, when the condition was really mitral stenosis with secondary leakage at the pulmonary valve. Again, the same murmur has been sometimes mistaken for a pericardial friction sound, particularly when noticed at the xiphosternum. We must accept this recommendation to interpret it correctly when it comes before us; unfortunately, he does not provide any means of identification, except the changeable and inconstant character of the murmur, and the fact that it is more audible in the erect than in the recumbent posture, often disappearing in the latter. It is strange that with so much obviousness of probability in favor of a functional pulmonary valve leakage in mitral stenosis, so little testimony in its support should hitherto have been received from clinical or pathological observation. The subject is of sufficient importance to call for systematic investigation.

"SOFT VALVE" MITRAL STENOSIS. Attention has been called by myself<sup>2</sup> to this not infrequent variety of the lesion in connection with a fatal case of loss of compensation in a woman, aged forty-three years, in whom the existence of stenosis was not suspected, owing to the complete absence of murmurs during a period of observation of eight weeks.

As regards the mode of production of the murmur of mitral stenosis, the case and specimen lent support to the view which is largely entertained, that the bruit is connected with the resistance offered by thickened and rough chordæ tendinæ to the direct current from the auricle, the valve having been found free, not only from marked induration, but particularly from any implication of the chordæ tendinæ and of the muscoli papillares; the result being a nearer approach to the "button-hole" type than to the "funnel."

*Tumors of the Left Auricle Simulating Mitral Stenosis* are, in spite of their rarity, of some distant interest to the practical physician, as this condition might be less impossible to treat surgically than the valvular stenosis for which they are generally mistaken. Quite apart from any

<sup>1</sup> Clinical Journal, July 24, 1904.

<sup>2</sup> Clinical Society Transactions, February 10, 1905; Lancet, and British Medical Journal.

future diagnostic possibilities which might lead up to attempts at mechanical treatment, the two cases reported in vol. xxxvii. of the *Clinical Society's Transactions*, by H. T. Thompson and C. U. Aitchison, present aspects of considerable importance. In both of them there existed well-marked signs of obstruction to the passage of blood through the mitral valve, together with embolism in one case of the dorsalis pedis artery, and in the other of the left side of the brain.

In the first case a well-marked presystolic murmur was heard in the earlier stages, but when the heart's failure became pronounced, it disappeared and gave place to a systolic apex murmur. In the second case a presystolic murmur was present till the end. In both all the cavities of the heart were dilated, and the valves were healthy, with the exception of the mitral valve in the first case. The tumors were regarded as myxomatous polypi.

**"New Methods of Studying Affections of the Heart."** The method to be described must appeal to the physiologist no less than to the clinical physician, as it is a means of investigating the normal phenomena, as well as their pathological variations in the human subject. It is essentially a comparative sphygmography, in which the heart's action is registered from its left ventricular side—viz., by means of the familiar apex tracing or radial tracing—and also from its auricular side; and herein lies the novelty. In favorable subjects and circumstances a tracing can be taken of the jugular pulse, which contains data capable of interpretation with the help of the simultaneous sphygmogram. The latter enables the carotid beat to be identified in the jugular curve, and this curve then becomes a record of the ventricular as well as of the auricular contractions.

THE FUNCTIONS OF CONDUCTIVITY for systolic stimuli, which is the special object of Mackenzie's<sup>1</sup> present study, is one of the four great functions attributed by Gaskell and by Engelmann and Hoffman, the founders of the "myogenic theory," to the heart fibre itself, apart from any interference by nerves. For, according to this theory, the heart possesses no motor nerves, the vagus and sympathetic nerves having only a moderating influence upon these varied functions of the heart muscle fibres. These primary functions of the myocardial fibre, upon which rests the cardiac automatism, are, in addition to *tonicity*:

1. The rhythmic production of stimuli.
2. The rhythmic excitability by these stimuli.
3. The rhythmic conductivity for these stimuli.
4. The rhythmic contractibility in response to them.

All these being rhythmic, it occurred to Wenckebach that four different forms of arrhythmia might be occasioned according as one or the other

<sup>1</sup> British Medical Journal, March 11, 1905.

of them chanced to be depressed, and he based his views upon Engelmann's experiments on the frog's heart. Mackenzie has been able to supply these views with their clinical demonstration.

It is essential to mention that the muscle fibres of the mouth of the great veins and adjoining remains of the sinus venosus possess the greatest power of automatically creating the wave of contraction, which then passes in a peristaltic manner over the rest of the heart "with varying speed—more slowly over those parts which retain a more embryonic character—namely, the auriculoventricular muscular ring and the bulbus arteriosus."

And it must also be mentioned that the muscular tissue joining the auricle and ventricle (canalis auricularis), while belonging to a less developed type and being less striated, so that the wave of conductivity passes more slowly over its fibres, possesses, nevertheless, a greater power of automatically creating a stimulus for contraction.

FIG. 4



The space *x* represents the time of the ventricular systole. The wave *a* is due to the right auricle, and the wave *c* to the carotid impact. The space *A* represents the *a-c* interval. The time marked in all these tracings equals one-fifth of a second.

*The Method of Estimating the Conductivity over "Gaskell's Bridge,"* that is, from the auricle to the ventricle, consists in timing the interval between the auricular systole (*a*) and the ventricular (*c*). This *a-c* interval or intersystolic period has a normal duration of one-fifth of a second or rather less. It includes (1) the systole of the auricle and (2) the interval during which the ventricular pressure is rising before opening the semi-lunar valves (*anspannungszeit* or presphygmic interval). As (1) and (2) are practically constant, they may for the purpose of this inquiry be ignored, any variation in the length of the *a-c* interval being due to variation of the rate of stimulus conduction.

To obtain a tracing of the jugular pulse, a shallow, open cup is placed over the lower end of the relaxed sternomastoid muscle. This cup (or receiver) is connected by means of a tube with a tambour, which is fitted on a Dudgeon or von Jacquet sphygmograph in such a manner that the lever of the tambour can be made to write on the same paper and at the same time as the sphygmograph lever ascribes the movements of the radial pulse.

*That a Depression of Conductivity may occur without any Arrhythmia* is well shown in two tracings (dated 1892 and 1904) from the same patient, in whom the radial pulse was quite regular, but the *a-c* interval lasted two-fifths of a second, showing a relative depression of the function.

Each cardiac contraction means a momentary abolition of all the rhythmic functions, and their subsequent recovery during diastole should be normally simultaneous for all. Delayed recovery means depression, which is often dependent upon a previous exhaustion, and relative rest, as from lessened frequency of beat, may then restore the conductivity to its previous rapidity.

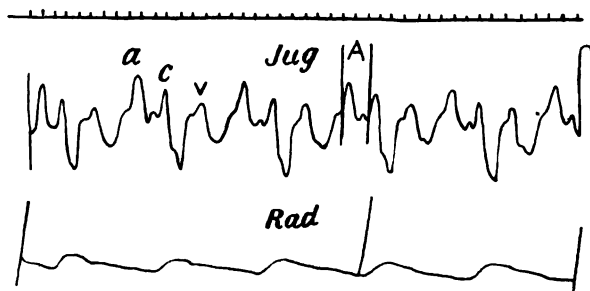
FIG. 5



The *a-c* interval (space *A*) is twice the normal period, lasting two-fifths of a second in place of one-fifth, as in Fig. 4, indicating a delay in the stimulus passing from auricle to ventricle (taken in 1904).

When a stimulus arises prematurely in the auricle, the conductivity has not yet been completely restored, therefore, the stimulus takes a longer time in passing to the ventricle, and as a consequence there is an increase of the *a-c* interval.

FIG. 6



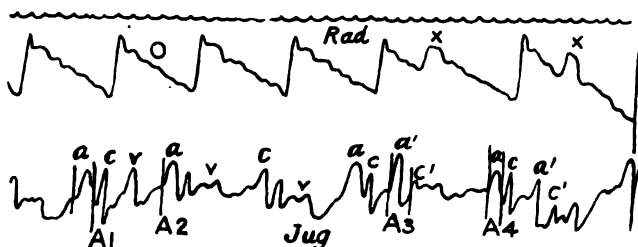
The *a-c* interval (space *A*) equals two-fifths of a second. (Taken in 1892 from the same patient as gave Fig. 5.)

*Arrhythmia* arises when the conductivity is so grievously depressed that the stimulus occasionally or frequently fails to cross the auriculo-ventricular junction. Manifestly the auricular systole *a'* (in Fig. 7) occurred so soon after the previous ventricular systole (as evidenced by the carotid wave *c* immediately before *a'*) that there was not sufficient time for the recovery of the function of stimulus conduction in these

fibres; and hence no stimulus reached the ventricle and a beat dropped out. By this means a longer rest is procured for these fibres, and when the next stimulus comes down from the auricle the *a-c* interval following the pause is shorter than the average.

*Bradycardia is Due to Depression of Conductivity.* Gaskell states that on applying a screw clamp around the auriculoventricular groove of a frog's heart, "according to the tightness of the clamp the ventricle can be

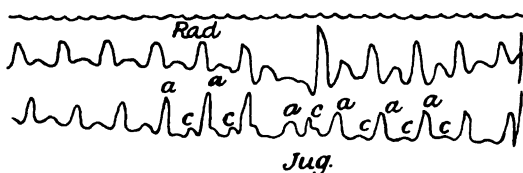
FIG. 7



Shows two premature or extra systoles of auricular origin (x). The waves *c'* in the jugular tracing occur at the same time as the small premature beats (x) in the radial tracing, and are therefore due to the carotid. These are preceded by premature waves *a'* due to the auricle. The interval *a'-c'* (space  $A_1$ ) is greater than the average *a-c* interval ( $A_2$ ), and is much greater than the following *a-c* interval ( $A_4$ ).

made to beat synchronously with the auricles, to respond to every second contraction of the auricle, to respond to every third, fourth, or other contraction, or to remain quiescent." All these varying results can be demonstrated to occur in the human heart.

FIG. 8

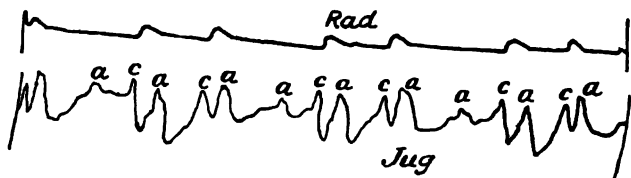


Shows a gradual lengthening of the *a-c* interval till a radial and carotid pulse beat drops out after the auricular wave *a'*. The following *a-c* interval is shortened.

*Independent Ventricular Rhythm Due to Heart-block.* When a ligature is applied in the auriculoventricular groove of the frog's heart, so that the stimulus can no longer be conveyed from auricle to ventricle, after a time the ventricle will beat with a rhythm different from and independent of that of the auricle (heart-block). This independent rhythm can be demonstrated as the cause of certain forms of bradycardia in the human subject. On careful analysis of Fig. 11, it is found that the two auricular

periods are less than one ventricular period, so that the relationship of the auricular systole to the ventricular systole is a constantly varying one, sometimes at a distance, then gradually approaching till they are synchronous. Whatever relationship the *a* has to the *c*, no variation takes

FIG. 9



Shows the venous pulse during the arrhythmia. The wave *a* is quite regular in its appearance.

FIG. 10



Diagram constructed to show that the arrhythmia is due to a blocking of the conductivity at the fibres joining auricle and ventricle (*A-V*).

place in the rate. It is remarkable that the pulse rate was almost invariably 30 to 32 beats per minute, whether working or lying in bed. Even when undergoing a surgical operation, observations before, during, and after the administration of chloroform showed the same uniform pulse rate. Prof. Wenckebach noted in a similar case that a glass of port wine

FIG. 11



Shows a more extreme form of bradycardia, where the ventricle responds to every third auricular systole. The large wave (*c*) is due to the carotid. In the last period there are but two auricular waves and the *a-c* interval is longer than after the period with three auricular waves.

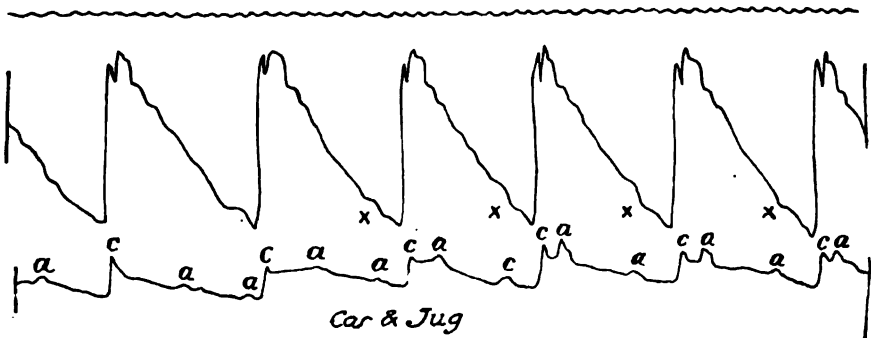
considerably quickened the rate of the auricular contractions, while the ventricular rate was unaffected.

It will be obvious from this account, which has been given as briefly as possible, with due regard to clearness, that the method is a new departure

in clinical observation, a first step in the analysis of the separate factors in the heart's mechanism, and, therefore, the nearest approach hitherto made to a discriminating use of the various heart remedies, which probably differ in their respective influence upon the several functions, but have hitherto been roughly grouped together as "heart tonics," and as such applied in a chance way without any knowledge of their individual suitability to the special requirements of each case.

**THE ACTION OF DIGITALIS ON THE HUMAN HEART.** Mackenzie<sup>1</sup> points out that it has been overlooked that digitalis has a peculiar tendency to affect primarily those functions of the heart-muscle fibre that have been previously damaged, the result being the production of an arrhythmia due to further depression of those functions. For instance, in hearts where the function of conductivity is normal, digitalis has no effect

FIG. 12



Shows in the tracing from the neck that the auricle *a* beats regularly and at more than twice the ventricular rate. The varying length of the *a-c* intervals showed that the ventricle pursued a rhythm of its own independent of the auricle. Note the small dips (*x*) in the radial tracing, due to the movement of the left auricle affecting the arterial column.

upon this function, though it may materially affect other functions of the heart muscle. But in cases where conductivity could be shown to be depressed, digitalis very speedily exaggerated this depression, and produced the characteristic dropping out of ventricular systoles.

With reference to the conflicting opinions held as to the relative value of various preparations of digitalis, their prescribers may have attributed the very striking results observed to the nature of the drug rather than to the susceptibility of the organ.

Mackenzie believes that the drug affects all non-striped muscle fibre, and that therefore before it can have any appreciable effect upon the heart it may have grievously affected other muscular organs. For

<sup>1</sup> British Medical Journal, March 18, 1905.

instance, the "gastric irritation," so frequently produced by digitalis is really due to the action of the drug in the musculature of the digestive tract.

The irregularity of the pulse so often observed after digitalis is attributed by Mackenzie to its "dromotropic" effect, that is, to its effect upon the function of stimulus conduction (Engelmann). This view is illustrated by a diagram and by simultaneous tracings from the radial artery and the jugular in patients presenting this symptom.

In a further contribution Mackenzie<sup>1</sup> endeavors to show that while in given states digitalis may not depress conductivity, it may take effect either upon the function of stimulus production (the "inotropic function" of Engelmann), or upon the function of excitability, or "bathmotropic function," if either of these should have become, owing to previous damage or depression, unduly sensitive to the drug. Cases such as these display the typical "*pulsus alternans* of digitalis," which in the regularity of its pulse periods (well shown in the Mackenzie tracings) contrasts with the double beat due to "extra systole."

In a fourth communication,<sup>2</sup> the *action of digitalis* is studied in cases where the rhythm of the heart is not governed by the auricle, but by the ventricle.

Lastly, under the heading of "The Inception of the Rhythm of the Heart by the Ventricle," J. Mackenzie<sup>3</sup> puts forward the view that nearly one-third of the cases of serious heart failure owe their suffering to this cause, including those diagnosed as chronic myocarditis, fatty degeneration, dilated heart, paroxysmal tachycardia, delirium cordis, chronic bronchitis with irregular heart, and others. He describes with what rapidity this leads to marked changes in the circulatory system and how rapid too are the patient's improvement, and the disappearance of the signs of heart failure as soon as the heart has reverted to its normal rhythm. This interpretation of the etiology of cardiac failure will probably not be accepted by clinicians without some hesitation. But he adduces arguments which support the causation of the "ventricular" rhythm by an overexcitability of the *a-v* fibres which join auricle and ventricle. These fibres, except in predisposed cases, are the most resistant of all to the influence of digitalis, and may, in spite of its administration, continue to "fire off" an extra systole from time to time.

THE CLINICAL STUDY OF "BIGEMINATE HEART RHYTHM," contributed by C. J. Fauconnet,<sup>4</sup> is of special interest in connection with the theory of "heart-block" recently brought into prominence by Wenckebach and

<sup>1</sup> British Medical Journal, April 1, 1905.

<sup>2</sup> Ibid., April 8, 1905, p. 759; *ibid.*, April, 1905.

<sup>3</sup> Ibid., April 15, 1905.

<sup>4</sup> Münch. med. Woch., December 20, 1904.



by J. Mackenzie. On the strength of Salaghi's experimental work, showing that a persistence of this rhythm must add to any engorgement of the lung due to mitral defect, he regards *pulsus bigeminus* as an imperative warning to withhold digitalis. His explanation attributes to the latter the causation of maximal ventricular systoles with wasteful but ineffectual extra systoles.

The frequency of cases of double heart beat is well known, and is illustrated by the numbers quoted by the author. This is doubtless due to the great prevalence of treatment by digitalis. But it also occurs quite independently, as in three instances which he mentions. This suggests some definite cardiac condition, such as "heart-block," which is apt to arise from varied influences.

**CHRONIC CYANOSIS WITH POLYCYTHÆMIA AND ENLARGED SPLEEN.** In connection with his patient, a woman, aged sixty-two years, whose case was peculiar in her having presented the condition all her life, and in association with otherwise similar cases reported by Vaquez, Cabot, McKeen, Saundby and Russell, Osler, Parkes Weber and Watson, R. M. Ronaldson<sup>1</sup> throws out the suggestion that the cyanosis is secondary to the polycythæmia and that the unexplained excessive production of red cells is probably compensatory, being required to fulfil some still unknown function other than mere oxygen carrying.

Assuming Malassez's view and that of Gibson to be correct, which assumes a normal retardation of the red cell in the capillaries, the delay in this affection would be for obvious reasons greatly increased, owing to greater viscosity and the red cells more completely deprived of their oxygen.

**Endocarditis.** **CARDIAC SYMPTOMS INCIDENTAL TO MALARIA** are described by P. Gallenga<sup>2</sup> in connection with three typical cases. They closely resemble those of acute infectious endocarditis or myocarditis, suggesting that the malarial infection, though as in these cases it may be mild, may in certain individuals exercise a specific action upon the myocardium. The symptoms in question—viz., ventricular dilatation with threatened failure and functional mitral incompetence—call for heart tonics as well as for quinine, and Gallenga recommends that the daily dose of the latter should not exceed 2 to 3 grams (30 to 45 grains).

**Malarial Cardiovascular Affections.** This large and important subject was discussed at the last Panhellenic Medical Congress at Athens.<sup>3</sup> Among 12,000 malarial patients observed by Triantaphyllides, of Batoum, 67 cardiopathies were traceable to the infection, viz., 30 cases of endocarditis (including 3 of pericarditis and about 23 mitral complications), 26 cases

<sup>1</sup> Edinburgh Medical Journal, September, 1904.

<sup>2</sup> Gazz. degli Osp., xxv., p. 139.

<sup>3</sup> Grèce med. militaire, 1904, v., Nos. 11 and 12.

of myocarditis, 16 cases of ulcerative endocarditis, 1 case of pericarditis, and 1 case of aortitis. Manoussos regards the cardiac hypertrophy as secondary to the enlargement of other viscera. Kanellis is a believer in an aortitis and an arteriosclerosis of infective origin.

*Pseudomalarial Types of Infective Endocarditis* have been studied by Warren Coleman in a paper in the *American Journal of the Medical Sciences* for March, 1905, to which the reader is referred.

*Tuberculosis of the Endocardium and of the Aorta*, found in advanced cases of the disease by various observers anterior to its experimental production in animals by Michaelis and S. Blum, has been studied by means of intracardiac injections of Koch's bacillary emulsion by Léon Bernard and M. Salomon,<sup>1</sup> instead of by intravenous injections. They claim that the resulting endocarditis may be regarded as analogous to the "primary tubercular endocarditis" first described by Jousset and Braillon, and is capable of being set up by injections into the ventricle, in the absence of any pre-existing endocarditis. Both in the endocardium and in the aorta the granulations are fibrinous and apparently identical (but for their bacillary contents) with those of common endocarditis, although typical nodules are to be found in the other tissues in the same hearts.

LARGE TUBERCULOUS NODES OF THE RIGHT AURICLE were found by Raviart and Caudron<sup>2</sup> after death from acute pneumonia in a man, presenting caseous bronchial glands and a small tubercle of the brain. The two firm nodes had perforated the endocardium, but not the pericardium. The cases agree with most others in the implication of the right auricle.

*A Hemorrhagic Form of Tuberculosis* of the heart is described by Guido Sotti.<sup>3</sup> His two cases show that this may show itself by isolated foci or by a disseminated tuberculosis of the whole heart.

TREATMENT OF INFECTIVE ENDOCARDITIS is still owned to be beyond our control, judging from the conclusions of Robert B. Preble and of Montgomery H. Sicard.<sup>4</sup> The latter finds treatment unavailing, except sometimes serotherapy. Preble, who limits himself to the subject of *pneumococcus endocarditis*, recommends rest and supporting measures. He regards this variety as representing 25 per cent. of all bacterial cases, and complicating attacks of pneumonia in the proportion of 1 per cent. of all cases and of 5 per cent. of the bad cases. It affects the valves of the right heart less often than of the left, but about four times more frequently than in any other form, and most often the aortic valves. Meningitis is a complication in 60 per cent. Leukocytosis is frequently absent and blood cultures are not always successful.

<sup>1</sup> Revue de médecine.

<sup>2</sup> Echo Med. du Nord., November 6, 1904.

<sup>3</sup> Giornale della R. Acad. di Med. di Torino, February and March, 1904.

<sup>4</sup> American Journal of the Medical Sciences, November 1904.

Sicard believes in the existence of rare cases of primary infective endocarditis. But it is usually secondary to rheumatism, to septicæmia, to the acute infectious diseases, or to an old endocarditis. Cases due to severe infection may survive a few days; the septic ones a few weeks. In the first variety the leukocytosis may reach 15,000 or more; in the latter it may be very slight.

A. R. Spencer,<sup>1</sup> in reporting the successful employment of *antistreptococcus serum* in a severe post-scarlatinal endopericarditis in a boy, aged five years, arrives at the following practical conclusions, also based upon the literature of the serum treatment: 1. The earlier the treatment is begun the better the hope of recovery. 2. It is undesirable to wait for ominous confirmations of the diagnosis, such as embolism. 3. The size of the dose should be regulated, not by the age of the patient, but by the gravity of his condition. With these views we most entirely concur, the only question being the efficacy of the individual serum.

**Myocarditis.** It is in the nature of things that myocarditis, with its scanty array of symptoms and absence of any truly distinctive sign, should occupy a position in our nosology the limits of which are ill-defined and may call for a searching survey. Any analytical work, such as that of Henry Jackson,<sup>2</sup> who describes seven varieties, or of John W. Bell,<sup>3</sup> who discusses the practical clinical aspects, including those of diagnosis, are welcome helps. But there is need for some comprehensive discussion and some authoritative pronouncement to establish that greater accuracy in terms which is the necessary basis for greater precision in thought, observation, and report.

We cannot quarrel with an expression such as "syphilitic myocarditis," applied to a case of a gummatous deposit in the heart wall, any more than with "syphilitic myositis" in a case of gummatous node in any muscle. Yet it would be better to connote, by using the strictly correct term, that there was not any myositis nor any myocarditis, though there existed a syphiloma in the situations described. In fact, much of that which is commonly termed myocarditis is of the nature of neoplasm, and another great batch is purely non-inflammatory degeneration. There remains a limited group in which true inflammation, localized or general, can be traced in the myocardium after death more often than during life. George Carpenter,<sup>4</sup> who had previously reported in *Pediatrics*, vol. ii. pp. 234 to 238, two fatal cases of heart disease in which the cardiac muscle was alone involved, claims to have diagnosed the condition during life in a child, aged seven years, and verified the diagnosis after death.

<sup>1</sup> Lancet, February 18, 1905.

<sup>2</sup> Boston Medical and Surgical Journal, September 29, 1904.

<sup>3</sup> New York and Philadelphia Medical Journal, May 14, 1904.

<sup>4</sup> Lancet, October 1, 1904.

To an analogous class, but not unexplained, belong the instances of acute myocardial heart failures in children observed by Forchheimer<sup>1</sup> after scarlet fever, diphtheria, typhoid fever, pneumonia, acute rheumatism, and septicæmia. The treatment includes absolute rest as the first essential, judicious stimulation, and if vasomotor paralysis should call for it, the hypodermic use of adrenalin.

ACUTE "DIPHTHERITIC" HEART FAILURE is attributed by Charles Bolton<sup>2</sup> to acute degeneration of the motor nucleus of the vagus, combined with extensive fatty degeneration of the myocardium. He believes this explains all the events, including vomiting and irregularity of rhythm. Recovery may leave, as stated also by White and Smith, a lasting latent weakness of the heart.

*The Cardiac Complications of Diphtheria* have been made the subject of a special study by F. W. White and H. H. Smith,<sup>3</sup> in a series of 1000 cases of the infection, the majority of which occurred in children. This has been considered by Dr. Preble in *PROGRESSIVE MEDICINE*, March, 1905, p. 142.

THE ETIOLOGY OF MYOCARDIAL INSUFFICIENCY is discussed by J. H. Pratt<sup>4</sup> in the light of the recent Leipzig teaching, viz., that (1) the alleged fatty metamorphosis (Quain, Rokitansky, Virchow) is merely an intra-cellular infiltration; (2) the cardiac muscle is therefore not hopelessly inefficient; and (3) that the symptoms of insufficiency are really those of the coexisting coronary sclerosis, with or without fibrosis. The practical bearing of this distinction would be still more important if arteriosclerosis were not in itself so intractable.

THE TREATMENT OF CHRONIC MYOCARDIAL DISEASE, with special reference to the recognition of the fatty and of the fibroid type, is detailed by A. A. Stevens.<sup>5</sup> He resorts to drugs, as does Forchheimer, in the treatment of the acute affections. So long as they are used with safety, it would seem but reasonable not to neglect any help they may offer.

THE TREATMENT OF HEART FAILURE IN PNEUMONIA AND IN DIPHTHERIA. The spirit of S. Solis Cohen's study in prevention and treatment, is A. Jacobi's<sup>6</sup> utterance, which he quotes: "The time to treat heart failure is before it happens." This is also true in diphtheria, where, according to Charles Bolton,<sup>7</sup> primary failure is the immediate cause of death when it occurs in the acute toxæmia. Nevertheless, we must not relax our endeavors to revive the failing organ, hoping always that the

<sup>1</sup> Archives of Pediatrics, 1904.

<sup>2</sup> Lancet, February 4, 1905.

<sup>3</sup> Boston Medical and Surgical Journal, October 20, 1904.

<sup>4</sup> Johns Hopkins Hospital Bulletin, October, 1904.

<sup>5</sup> American Medicine, August 6, 1904.

<sup>6</sup> Journal of the American Medical Association, December 10, 1904.

<sup>7</sup> Lancet, February 4, 1905.

weakness may be rather an idiosyncrasy under temporary stress than the result of unsurvivable destruction.

THE CASE FOR AND AGAINST ATHLETICS is reduced to terms of simple common sense by Robert E. Coughlin.<sup>1</sup> All depends upon the proportion and fitness of things. Athletics and "muscle building" are sometimes pushed to relative excess in those bearing definite delicacy of the cardiovascular or of the nervous system. In themselves they cannot remodel a constitution. But it is obvious that the attendant hygienic circumstances of regular sleep and digestion, increased ventilation, circulation, secretion, and excretion, and metabolism generally, together with almost absolute rest for the psychomental spheres must make for improved strength of the framework and of the mechanisms, if only they are of the wear-resisting material. It is part of the function of a muscle to live up and "live down" to its work. One cannot, therefore, share any misgivings lest hypertrophy of muscle should in itself predispose to degeneracy. Cardiac hypertrophy based upon progressive valvular lesion or toxæmia is totally distinct from that under consideration.

**Physical Signs and Physical Methods of Examination.** The physical examination of the heart by the ordinary procedure owes much to radio-scropy, which has justified the claim of the experts that percussion is competent to furnish an accurate outline. It has, moreover, supplied us with a sure criterion of the results and of the relative value of the various methods. Recognition has thus been secured for the indispensable requirement of a total cardiac outline. Any technique which can only provide the tracing of the absolute dulness, or representations of the organ lacking the faintest resemblance to its contour in health or in disease, is henceforth shown to be hopelessly inadequate and misleading. Three elementary principles are now being voiced by authorities such as de la Camp<sup>2</sup> and Goldscheider.<sup>3</sup>

The discussion as to the relative efficiency of different styles of percussion, and particularly of "superficial *versus* deep percussion," so long inconclusive on the insecure footing of individual opinion, is likely to end of itself. Sir W. T. Gairdner<sup>4</sup> has renewed, after upward of twenty years, his advocacy of the light stroke. The fact is that only a sufficient delicacy of manipulation can yield the tracings which are verified by the x-ray, and that the heavy stroke entirely fails to localize the remote boundaries which it is supposed to sound in the depth.

The sectional delimitation of the various heart cavities is beyond the

<sup>1</sup> Medical Record, September 24, 1904.

<sup>2</sup> Berliner klin. Woch., February 13, 1905.

<sup>3</sup> Ver. f. inn. Med., Berlin, January 2, 1905; Sem. méd., January 11, 1905.

<sup>4</sup> Edinburgh Medical Journal, November, 1904; New York and Philadelphia Medical Journal, December 17, 1904.

present scope of our manual methods. Here again, radioscopy has saved us from erroneous conclusions; for it has shown the futility of the Marburg contentions that the phonendoscope and auscultatory friction can discriminate between ventricle, auricle, and septum. On the other hand, it has itself made some progress in that direction. Not only does it reveal cardiac variation in general outline and position special to partial and to deep inspiration and expiration,<sup>1</sup> but, according to Kraus,<sup>2</sup> it reflects in the "moulding of the contour" some of the morbid departures from the normal outline, such as, for instance, the extension of the right upper border in aortic and mitral defects, the increased convexity of the so-called "left middle arc" in mitral insufficiency, and the marked contrast in the degree and prominence of the "left lower arc" in mitral stenosis and insufficiency respectively. Inasmuch as the auricular and the ventricular systole can be clearly distinguished, it thus becomes possible to verify the correctness of Mackenzie's sphygmographic method; for after artificial inflation of the stomach independent auricular contraction may sometimes be identified in the proportion of 2 or 3 to 1 ventricular systole.

**INSPECTION. *Broadbent's Sign.*** It is well known that systolic retraction of the left eleventh and twelfth ribs and of their interspaces has long ceased to be claimed by Broadbent as a trustworthy sign of intrapericardial adhesions of the heart. A. W. Tallant<sup>3</sup> draws our attention to the fact that, in their absence, it is often perceptible in thin subjects, apparently from cardiac hypertrophy, and suggests that this may be due to the pull upon the normal attachments of the pericardial sac to the diaphragm. It seems necessary to make a distinction between the retraction of the interspace and that of the ribs themselves. As regards the former, I believe that it may sometimes be transmitted from the heart through an imperfectly expanded and partly compressed lung. Marked systolic retraction of the twelfth rib is, in my opinion, often due to adhesions of the diaphragm to the base of the lung, or in the pleural sinus, thus shortening and tightening the muscular fibre. Mere cardiac enlargement by depressing the diaphragm somewhat slacks its pull, though it would render it more direct. We are still very uncertain as to this sign.

**PALPATION OF THE HEART** has been practised by Bassi<sup>4</sup> in heart disease as a useful confirmation of the data of percussion, particularly in children. But his estimate of its capabilities is not so high as that entertained by Robert Maguire, who, some years ago, thought that it was possible to palpate the outline of the whole heart with accuracy, even in

<sup>1</sup> Goldscheider, loc. cit.

<sup>2</sup> Deutsche med. Woch., January 19, 1905.

<sup>3</sup> Boston Medical and Surgical Journal, October 27, 1904.

<sup>4</sup> Gazz. degl. Osp., 1904, No. 58.

the adult. I doubt whether palpation can improve upon the work of light finger percussion, though an indispensable adjunct to it.

**AUSCULTATION.** *The Diagnostic Value of Dorsal Auscultation* is well brought out by W. Libensky's<sup>1</sup> observations in 22 cases of aortic valvular incompetence and numerous mitral cases. In the latter the distinctive locality for the bruit is the lower angle of the left scapula; in the former the left supraspinous fossa, and the three upper dorsal spines, though the aortic murmur is often not audible in the slighter cases. These statements are in agreement with general experience. There is also much to say for Libensky's view that enlargement of the right ventricle is responsible for the loudness of the bruit heard at the left thoracic base. There can be no doubt that thereby the position of the left ventricle is altered in a backward direction, and, moreover, that its apex may be kept from direct contact with the anterior chest wall. This alone has been long held to explain the conduction of the murmur of mitral regurgitation to the axillary and infrascapular regions, and it may also explain the fact that functional ventricular murmurs are not conducted that way. The question is, however, how far we can trust to the degree of loudness of the dorsal murmur as a safe test for the severity of the lesion? We should remember that the loudest murmurs are not always due to the worst lesions, and that there are other factors besides a relative approximation of the left ventricle to the posterior chest wall which might influence the transmission of the murmur. Nevertheless, Libensky affords us a valuable confirmation of two important facts: (1) that a murmur heard with special and exclusive loudness below the angle of the left scapula is certainly of mitral origin, and (2) that any considerable dilatation of the right side of the heart tends to favor the dorsal localization in question by imparting to the left ventricle a more backward aspect.

**PERCUSSION.** *The Supine Attitude* of the patient is not always possible; neither is it unanimously thought to be the best for cardiac percussion. In a large proportion of the cases where examination is most needed, the patient cannot recline. M. B. Lewy<sup>2</sup> gives a special reason for preferring the upright posture of the thorax, "it brings about slight cardiac fatigue, the evidence of which may be of value;" at the same time, he believes that any posture will serve our purpose, provided it is always the same. Most of our clinicians would doubtless stipulate for the more complete information which can only be obtained by varying the patient's position, and that the average position suitable to all cases is one of moderate inclination of the thorax in the dorsal decubitus.

<sup>1</sup> Wiener klin. Rundschau, 1904, Bd. xviii., No. 50.

<sup>2</sup> Sem. méd., January 18, 1905.

*Several Neglected Points in the Cardiac Examination of Children* have been investigated by S. McC. Hamill and T. Le Boutillier.<sup>1</sup> 1. *The Position of the Apex Beat*, investigated in 275 infants and children, was found to be up to the sixth year more commonly in the fourth intercostal space and in the midclavicular line, and afterward usually in the fifth space in or just within the midclavicular line.

2. *The Area of Cardiac Dulness* averaged as follows: In children under three years of age: upper border, second rib; right border, midsternum; left border, just within the midclavicular line. From the third to the sixth year: upper border, the upper border of the third rib; right border, midsternum; left border, in or just without the midclavicular line. From the sixth to the twelfth years: upper border, third rib; right border, from the midsternum to the right edge of the sternum; left border, most commonly in the midclavicular line.

3. *The Venous Hum* was listened for in 226 subjects and was heard in a proportion of cases at all ages, usually best over the right jugular, but often, too, over the left, and it was apt to extend to the manubrium. It was not audible (except in 10 cases) in the recumbent attitude. This postural influence and the fact that even in recumbency it may be induced by full extension of the head, seem to be arguments against the reliability of "Eustace Smith's sign" of enlargement of the bronchial glands.

4. *Functional Heart Murmurs* have been wrongly regarded as exceedingly uncommon. They would appear to be somewhat common; but, perhaps, as suggested, rather owing to loss of general nervous and of cardiovascular tone than to anæmia. They were not exclusively, but more frequently heard after the third year, chiefly over the pulmonary site, and next often over the ventricular area, and in almost every instance only in the recumbent position.

**The Treatment of Heart Symptoms.** **CEDEMA AND DECHLORIDATION.** The study of œdema in relation to chloride of sodium and to various lymphagogues is being pursued with eagerness by French pathologists, who expect great results from the researches now in progress. Although it would not be opportune at this stage to devote much space to a review of a question which another twelvemonth will carry much farther, attention should be called to L. Ambard's paper<sup>2</sup>, which deals also with the rôle of digitalis and of theobromine in œdemas and retentions. He believes that digitalis has no direct action upon the heart, but an indirect one only through the diuresis which it induces. Theobromine, too, does not act directly, but indirectly upon the kidney. He supposes that they both exert an attraction upon the tissue serum, drawing it into the blood, and thus antagonize certain metabolic, albuminotoxic, non-crystalloid

<sup>1</sup> Journal of the American Medical Association, January 7, 1905.

<sup>2</sup> Sem. méd., October 5, 1904.



substances, which drive the serum into the tissues and concentrate the blood. These are quasi "secretory" acts and dominate the situation, the saline osmotic events being merely physicochemical, as it were, under-currents, not vital phenomena.

The subject of oedema in its double relation to the circulation and to metabolism and the kidney has been raised to a new level by the pioneer work of George Oliver on tissue lymph (noticed in last year's report) and of Widal and Javal on chloride retention, and Javal<sup>1</sup> has recently contributed a useful article on the "Indications for the Dechloridation Treatment in Oedema."

*Elaterium in Non-Purgative Doses.* Henry Sewall<sup>2</sup> reports excellent and durable results in a series of 20 cases from doses of  $\frac{3}{8}$  of a grain, on two or three successive days, every hour, until nausea is produced. Nausea occurred in about half his cases. Some purgation usually resulted also. He believes in a special power of the drug to promote absorption from the tissue spaces.

**DIGITALIS: ITS ADVANTAGES AND RISKS.** Owing to the cumulative property of digitalis, its administration in increasing doses is capable of exceedingly varied effects. The therapeutical or "peripheral" effect would be the first to appear; the physiological or "central" toxic effects would follow from a longer continued administration or of larger doses. Just as we have morphinism or cocainism, we may then have digitalism.

The action of digitalis upon the heart and circulation is clearly stated by J. R. Bradford<sup>3</sup> to be superior to that of any of the other allied glucosides, such as those of strophanthus, apocynum, convallaria, etc., and to have held its own since it was first applied (about 1773) for the relief of dropsy. Digitoxin, its most poisonous ingredient, soluble in alcohol and therefore contained in the tincture, takes a marked effect upon the nervous system and the alimentary canal in contrast with digitalin and digitophylin. This must be borne in mind in connection with its extremely cumulative property, and with its special character as an irritant to the mucous membrane.

Upon the central nervous system its poisonous effects are in succession, delirium, collapse of the nervous centres, and lastly arrest of respiration, so that death is not necessarily due to its action upon the heart. Another important effect of fatal doses is suppression of urine. All these results are apt to occur in every-day practice from relative overdoses or cumulation of digitalis, and in a minor degree from strophanthus, apocynum, convallaria, or other allied glucosides also.

As a general protoplasmic poison, digitalis develops its chief power

<sup>1</sup> International Clinics, vol. iv., fourteenth series, 1904.

<sup>2</sup> Therapeutic Gazette, November, 1904.

<sup>3</sup> Clinical Journal, July 27, 1904.

upon muscle of all kinds. In the frog its local application to the heart or to involuntary fibres is capable of arresting their contraction. And in general it acts much more powerfully upon involuntary than upon voluntary fibre, in exact opposition to strophanthus; both of them acting powerfully upon the cardiac fibres.

The three forms of activity of muscle, rapidity of contraction, tonicity of contraction, and rhythm of contraction, are differently influenced by digitalis. In the frog its local application so much increases the systolic tonicity that the rhythmic automatic stimulus is overwhelmed and the heart permanently ceases to beat, although still living. The usual form of slowing is worked through the inhibitory mechanism, central and cardiac, which also develop increased power in the contraction. This effect is prevented by a previous administration of atropine. In mammalia the toxic arrest is never systolic, but diastolic, perhaps owing to the much higher development of the inhibitory mechanism which centres in the auricle, whereas the other action, that of increased force, is the direct action of the drug upon the ventricle. The complete emptying of the latter is more favored than that of the auricle, and this is apt to become overdistended as a result of digitalism. A further effect is the dropping of some of the beats, and still more advanced result is the enfeeblement of some of the systoles. A block occurs at the auriculoventricular groove, which the diminished auricular impulses do not transgress and the ventricle takes on its own independent beat. Hence there is increasing irregularity with the progress of digitalization. J. Mackenzie, of Burnley, has directed special attention of late to the clinical occurrence of this perverted gait, or arrhythmia of the heart with the ventricular inception of the cardiac rhythm.

The first result of digitalism is thus a bigeminate beat or an alternating strength of beat. More complex groupings and intermissions will next arise until the chaotic action named *delirium cordis* is reached. Though the two ventricles may act with different power, they never beat at different times, but always together; although the impression conveyed in *delirium cordis* is apt to suggest an opposite conclusion. The muscular stimulation and response are in fact apt to tell unilaterally, but the innervation is affected bilaterally.

*Digitalis as Affecting the Vessels.* Lasting constriction of the arteries is the most special feature of digitalis, strophanthus having only very slight action upon the arterial fibre, and having, therefore, with certain advantages, the disability of not being able to keep up blood pressure, the failure of which is usually the precursor of death. This constricting effect has been proved by experiment to be a direct local effect. But

<sup>1</sup> Loc. cit.

there is no experimental evidence supporting the statement that the renal arteries are dilated by it. Bradford<sup>1</sup> states that they are constricted like all others, as demonstrated in all of them except the cerebral arteries. Therefore, the diuretic action must be due to the increased blood pressure where it had previously fallen too low, for Bradford reminds us that in health digitalis is not a diuretic. Its service is to restore healthy circulation and normal urinary flow. Its physiological or toxic renal effect is just the opposite, that of diminishing or even suppressing the urine.

*Digitalism and Sudden Death.* The sudden deaths occurring on sitting up are sometimes ascribed to the digitalis which may have been taken. Bradford, while recognizing the various physical and vasomotor reflex events which accompany the act of sitting up, suggests that those sudden deaths may have resulted from the disease rather than the remedy. Indeed, I would add that the threatened arrest of heart or respiration may sometimes have been the cause of the patient sitting up.

In conclusion, let us look at the heart merely during its systole, but remember the diastole, when the heart is still resisting distention. If it receives too much blood it will fail to expel all of it, and the circulation will be deranged. The virtue of digitalis is apparent in this direction. It keeps up the tonic diastolic ventricular attitude, braces up the ventricular wall against the auricular flood, and thus regulates the systolic charge. I agree with Bradford in regarding the most valuable service of digitalis to be an increased cardiac tone. The next in value would be the constriction of the bloodvessels coincident with the diuretic action, and the least steadying of the rhythm with an increase in the force of the beat. This slowing action is not obtainable in pyrexial tachycardia, nor in tachycardia due to nervous causes, but chiefly in affections of the muscular mechanism of the heart. "Strophanthus has not been so serviceable, and not a great success. It does not raise blood pressure, and without blood pressure there can be no circulation."

MORPHINE has been recommended as a quick substitute for digitalis, the effects of which require two or three days to allay irritability, hurry, pain, and dyspnoea, even in the presence of anginal manifestations. This is much insisted upon by Grassmann,<sup>1</sup> who advocates repeated small doses for the relief of Cheyne-Stokes' symptoms. This beneficial effect of morphine in extreme conditions is worth securing, not using it as a substitute, but to prepare the way for digitalis. Unexplained sudden deaths from moderate injections have been recorded. They are rare, but teach us caution. The acute affections, and those with effusions or pulmonary and renal complications, are less suited for the use of the remedy than subacute and chronic cases with subjective sensations and nervous overstrain or fatigue.

<sup>1</sup> Münch. med. Woch., 1904, No. 28.

THE TREATMENT OF THE CARDIAC FORM OF INSOMNIA, which rouses the patient with heart discomfort after an hour's sleep, chiefly when he has lain on the left side, is the administration of a minute dose of digitalis (0.015 gm.),  $\frac{1}{10}$  gr., and of morphine (0.0025 gm.) at bedtime. Feilchenfeld<sup>1</sup> has found this most successful. Other cases are due to intestinal irritation and need two or three small doses of sulphonal (0.25 gm.) during the afternoon.

NITROGLYCERIN, owing to the fact that degrees of individual susceptibility differ so greatly, is a somewhat awkward remedy. H. P. Loomis<sup>2</sup> dwells upon its limitations, as, for instance, in marked arteriosclerosis. He believes, however, that its failure in suitable conditions has often been due to the inadequacy of the usual dose. He regards  $\frac{1}{50}$  of a grain as a minimum for ordinary purposes, and much fuller doses are often indicated.<sup>3</sup>

SUPRARENAL EXTRACT AND ADRENALIN. That in the suprarenal substance we possess a most powerful stimulant to the heart and to the muscles is placed beyond all doubt by the careful observations of Beaman Douglass<sup>4</sup> on "The Effects of Suprarenal Preparations on Living Protoplasm." To mention only one of his experiments on the turtle's heart, the result in five minutes after an intraperitoneal injection of 2 c.c. of a 0.001 solution of the alkaloid was to raise the heart rate from 67 beats in five successive minutes to 144 beats, the normal rate not being re-established before three hours. No less striking were the rapid and violent contractions and the extreme tonic spasm respectively excited in *Medusæ* by moderately strong and by very strong solutions. Douglass sums up his extensive investigation in the conclusion "that suprarenal preparations have a tremendous influence on the power of cell division, on the development of protoplasm, on the movement of cilia, and on contractile tissue."

*Influence of Suprarenal Extract upon Absorption and Transudation.* Similar views as to the mechanism of this retarding influence are arrived at by S. J. Meltzer and John Auer,<sup>5</sup> as a result of a laborious research. They consider that the extract causes a contraction around the endothelial pores through which they believe that transudation and absorption takes place; in a word, that by an increased tonicity of the endothelial protoplasm a decrease of the vital permeability of the blood and lymphatic capillaries is brought about. It is necessary, however, to add the author's statement that: 1. Intravenous injections of suprarenal extract retard invariably the processes of absorption and transudation. 2. Sub-

<sup>1</sup> Berliner klin. Woch. 1904, Bd. xli.

<sup>2</sup> Medical Record, New York, March 18, 1905.

<sup>3</sup> Von Noorden.

<sup>4</sup> Journal of the American Medical Sciences, January, 1905.

<sup>5</sup> Ibid., pp. 114-129.

cutaneous injections also often show a retardation of these processes; the effect, however, is neither strong nor constant. 3. In frogs the retardation of absorption of some substances was recognizable only when suprarenal extract was previously mixed with that substance, or when both substances were injected into one and the same lymph sac.

The inferences from clinical observation as to the mode of response of heart and bloodvessels to suprarenal preparations are thus entirely borne out. We possess in them remedial agents of the first order, both as regards power and adaptability.

From his research on suprarenin, Mueller<sup>1</sup> reports among other favorable results, that the solution (which can be sterilized by boiling before injection) stimulates the heart, and that 1 c.c. of the 1:10,000 solution can be injected into the myocardium of animals; 10 c.c. of the 1:1000 solution can be safely injected subcutaneously into the human subject. As this strength absolutely controls parenchymatous hemorrhage, its local use is indicated in operations on the liver or kidney.

Caution in the use of the adrenalin injection is impressed upon us by J. Barr's<sup>2</sup> experience. In a boy with pericardial effusion, after the removal of 20 ounces of serum, an injection of 40 mm. of a 1:1000 solution of adrenalin was made into the pericardial sac. The result was that the pulse disappeared at the wrist, and for a time the boy's life was in imminent danger. "Here the cardiac failure must have been due to contraction of the coronary arteries." Oliver and Schafer had found experimentally that the depressor nerve failed to act when the arteries were contracted by suprarenal extract.

CARDIAC TREATMENT BY HYGIENIC MEASURES is a rapidly expanding subject. Alexander Morison<sup>3</sup> deals happily with the treatment of the muscular, hæmic, and mechanical factors. To C. M. Cooper<sup>4</sup> we owe practical remarks on "Posture in the Treatment of Disease." Again, "cold" locally applied has been held to be of value on the strength of the rapid relief so often observed after the use of the ice-bag; but Krebs<sup>5</sup> has arrived at the conclusion that much of the alleged benefit in cases where cold has been employed systematically has been really due to the rest enforced upon the patient.

HYPERPYREXIA. John Haddon enters a strong plea in favor of Currie's *cold affusion* in hyperpyrexia, a forgotten boon. But Berg<sup>6</sup> deprecates its employment in those special cases which are due to measles or scarlet fever, with checked cutaneous exanthem.

<sup>1</sup> Münch. med. Woch., Bd. li., Heft 5 and 6.

<sup>2</sup> British Medical Journal, January 14, 1905, p. 56.

<sup>3</sup> Edinburgh Medical Journal, November, 1904.

<sup>4</sup> Journal of the American Medical Association, December 10, 1904.

<sup>5</sup> Berliner klin. Woch., April 25, 1904.

<sup>6</sup> Medical Record, July 2, 1904.

THE ABUSE OF WATER-DRINKING IN DISEASE, deprecated by Morris Manges,<sup>1</sup> has various evil effects, more often in the direction of the heart and circulation than in others, and the physician should think well before prescribing "as much water to drink as you can."

THE "ROSE-ROSEWATER" PLASTER ABDOMINAL BELT used since 1897 by Nathan Rosewater,<sup>2</sup> but more often associated with the name of "Achilles Rose," possesses, according to Rosewater,<sup>3</sup> among its varied capabilities, that of steadying the irregular and labored heart by preventing "an oversupply of blood being constantly pumped into the brain and crowding the lungs." He claims that the same controlling influence is evidenced by the entire disappearance without medication of hypertrophies of the tongue and tonsils, etc. The varied individual tolerance of the skin complicates the question, but Clemm and others in Germany have paid this method the compliment of imitation.

HIGH ALTITUDE is usually contraindicated, but G. Galli<sup>4</sup> reports good results and no drawbacks in 2 cases of irritable heart, 2 cases of aortic insufficiency, and 1 case of Adams-Stokes' affection, all treated at an elevation of 4000 feet.

### THE ARTERIES.

**The Aorta.** AN INTRATHORACIC EQUIVALENT OF THE "PTOSIS OF THE ABDOMINAL AORTA," which has recently been described by Stifler,<sup>5</sup> is probably to be found in certain cases of cardiopptosis; and some analogy may also possibly be traced in the future between the two sets of symptoms. Hitherto special attention has not been called to the aortic section in that group of functional disturbances of the vasomotor and secretory regulation, which is referred to by Stifler as "sympathicismus." The "loose" abdominal aorta may be contracted or it may be dilated. To the latter variety belonged a case in which Stifler mentions the coexistence of cardiopptosis, as well as of the kidney symptoms which are the usual accompaniment of the aortic displacement and which sometimes simulates those observed in true aneurysm of the aorta.

CHERCHEVSKY'S NORMAL AORTIC PERCUSSION REFLEX<sup>6</sup> (described in the *Semaine médicale*, 1898, pp. 409 and 410) consists in a widening of the area of the aortic dulness as a result of percussing the second right interspace with a hammer, and in a diminution of the same area of dulness when the epigastric fossa is percussed, this had been stated by Cher-

<sup>1</sup> New York and Philadelphia Medical Journal, January 21, 1905.

<sup>2</sup> Cleveland Medical Journal, May and June, 1900.

<sup>3</sup> New York and Philadelphia Medical Journal, August 19, 1904.

<sup>4</sup> *Rif. Med.*, xx., 1904, No. 12.

<sup>5</sup> *Berliner klin. Woch.*, 1904, Bd. xli., No. 36.

<sup>6</sup> *Sem. méd.*, December 14, 1904.

chevsky to be absent in diseases of the aortic wall, and this absence he had regarded as diagnostic of aortic lesions. But E. Rondot, of Bordeaux, who is careful to exclude the factor of pain by using his fingers instead of a hammer, finds that the reflex may be absent in quite early stages of various types of aortitis, anterior to any structural lesions. Moreover, he has noted the same absence in various kinds of acute cases not suffering from aortitis. This would seem to deprive this sign of much of its alleged significance as a test for aortic trouble.

IN A CASE OF ACUTE AORTITIS, which lasted in a man, aged forty-five years, only seventeen days, instead of the more usual duration of two to six months, death occurred suddenly; this probably resulted, as thought by Walter Broadbent,<sup>1</sup> from an almost complete occlusion of the coronary orifice by the acute swelling which was grafted upon pre-existing atheroma.

*A Case of Acute Postinfluenzal Aortitis* in a man, aged twenty-eight years, followed by the slow evolution of atheroma, aortic valvular insufficiency and Bright's disease, is described by M. Breton.<sup>2</sup> The gradual development of the lesions extended over a period of eight years.

The aorta has received an unusually large share of attention from the pathological side, as well as the clinical. Experimental pathology has now demonstrated beyond any doubt the production in rabbits by systematic treatment with adrenalin of aortic lesions analogous to atheroma, a fact laden with weighty inferences.

Our knowledge on the causation of *aortic aneurysm* has also been much advanced by the searching investigations of Chiari and of Benda<sup>3</sup> on *syphilitic mesoaortitis*, which they believe leads to the gummatous degeneration and scarring responsible for the loss of parietal support and for the resulting sacculatation. Their conclusions help to justify our empirical belief in the value of the treatment of aneurysm by iodides and to explain its varying measure of success.

*The Share Taken by the Elastic Tissue of the Aorta in the Pathological Processes* has been variously discussed. Fritz Schwitzer<sup>4</sup> considers it to be a leading one, as he believes the chief function of the elastic coat is that of "inhibiting overexpansion." Its lesions, if carefully analyzed, furnish us with a clear distinction between senile changes, syphilitic aortitis, and true arteriosclerosis.

**Arteritis.** A third case of obliterative arteritis leading to gangrene of extremities in an otherwise apparently healthy man in the prime of life is added to those previously reported in 1903 by E. Michels<sup>5</sup> and F.

<sup>1</sup> Lancet, May 27, 1905.

<sup>2</sup> Sem. méd., April 26, 1903.

<sup>3</sup> Verh. d. Deutsch. path. Gesells., 1904, Bd. vi.

<sup>4</sup> New York and Philadelphia Medical Journal, July 9, 1904.

<sup>5</sup> British Medical Journal, September 12, 1903.

Parkes Weber.<sup>1</sup> All three occurred in London East End Jews. I. Israël,<sup>2</sup> of Berlin, has also recently described idiopathic gangrene observed in men of thirty to forty years, especially Russian Jews.

**The Influence of Emboli upon the Temperature.** The clinical interest of J. Hanatek's<sup>3</sup> experimental production of embolism in dogs by injecting starch, small beads, etc., or by introducing rough wire into the jugular and other veins lies in his conclusion that while irritation of the vein and embolism set up pyrexia, direct irritation of the endocardium by the introduction of a glass rod or otherwise causes a fall of blood pressure and lowering of the temperature. He believes that this may explain why an embolus in the pulmonary artery sometimes does not give rise to any fever; in these cases the occurrence of irritation of the endocardium probably accounts for the apyrexia.

**Arteriosclerosis.** THE ETIOLOGY OF ARTERIOSCLEROSIS is acquiring ever-growing importance in connection with our endeavors to lengthen the span of life. The analytical method is needed not only, as claimed by T. D. Savill,<sup>4</sup> for a separate investigation of each of the three arterial coats, but in a special degree for a better division of the heterogeneous group into its separate varieties and into its stages. The question as to its pathology has divided the greatest authorities in the past and remains unanswered still. The prevailing view has attributed primary importance to occlusive changes in the nutrient vessels or vasa vasorum (Martins). D. L. Jores,<sup>5</sup> of Bonn, who has made a special histological study of the changes in the internal coat in which he describes three varieties of lesion, a mixed form and two pure forms, the one strictly hyperplastic affecting the composing elements of the intima, the other proliferative affecting chiefly the subendothelial tissue, ascribes the causation to an exaggerated response on the part of the coat to the call for increased resistance to an inordinate blood pressure. T. D. Savill lays great stress upon the part played by the middle coat in the early etiology, owing to that overgrowth of the muscular layer to which he has attached the name of "arterial hypermyotrophy," which may result from chronic renal disease, but has many other causes productive of the high arterial tension. Hence, the importance of a recognition of its potential evils, such as circulatory accidents, nutritional disturbances, disturbance of balance between heart and arteries, and inevitable degenerations, senile decay, and postural vertigo. The combination of arterial hypermyotrophy and focal necrosis of the

<sup>1</sup> British Medical Journal, April 8, 1905.

<sup>2</sup> Berlin Medical Society, November 9, 1904.

<sup>3</sup> Wiener klin. Rundschau, Bd. xviii., Nos. 50 and 52.

<sup>4</sup> Lancet, September 24, 1904.

<sup>5</sup> Wesen und Entwicklung der Arteriosklerose, etc., Wiesbaden, J. F. Bergmann. (An Anatomical and Experimental Inquiry as to the Nature and Causation of Arteriosclerosis, F. Bauermeister, Glasgow, 1903.)



media may produce death by hemorrhage at a comparatively early age.

The external coat has also been credited with some primary causal agency, for Thoma propounded the view that the arteriosclerotic deposit was nothing more than a patching up or plastering up of weak spots, the filling in of the depressions of the intima over small aneurysms or pockets produced by overstrain in the adventitia. The older views were more general in scope and in expression. Virchow and Cohnheim regarded the proliferation as inflammatory in a modified sense. Rokitsansky suspected that the deposits might be derived from the blood itself, and Traube that they were the outcome of local settlements of leukocytes.

THE RELATION OF THE ACUTE INFECTIONS TO ARTERIOSCLEROSIS has been studied by William Sydney Thayer and Clinton Ethelbert Brush, Jr.,<sup>1</sup> and supports the view that while typhoid fever must be regarded as a factor in the production of arteriosclerosis, acute arteritis of the medium-sized and smaller vessels is an undoubted result of the infectious diseases. According to them, rheumatism ranks first and typhoid next in the production of "palpable arteries." The authors, while recognizing the predominant causal importance of hypertension, suggest that the special effect of the acute infections may be the production of those focal degenerations with secondary regenerative changes which constitute the other important element in arteriosclerosis. They have done good work in calling attention to the possible analogy between the vascular sequelæ of some general infections and those of syphilis. The latter are believed by C. Travis Drennen<sup>2</sup> to be rather due to the mercury than to the disease; but he gives not the slightest evidence in support of his opinion.

THE ETIOLOGICAL INFLUENCE OF ALCOHOL in the production of arteriosclerosis is studied by Richard C. Cabot,<sup>3</sup> and the share attributable to *lead* by Frank S. Billings,<sup>4</sup> with the thoroughness special to these distinguished authorities.

The predisposing and determining causes of the affection cannot be too often restated. J. M. Anders<sup>5</sup> divides them into five categories: 1. Toxic agencies, such as syphilis, alcohol, and gout. 2. Overeating (excess of carbohydrate and nitrogenous food). 3. Constant hypertension of the arteries produced by muscular overstrain, as in some forms of athletics. 4. Aortic regurgitation. 5. Oncoming senility (senile degeneration). Prophylaxis should be begun in early life, whenever a tendency exists, along the lines which this list suggests.

<sup>1</sup> Journal of the American Medical Association, September 10, 1904.

<sup>2</sup> *Ibid.*, p. 729.

<sup>3</sup> Journal of the American Medical Association, September 17, 1904.

<sup>4</sup> *Ibid.*

<sup>5</sup> American Medicine, June 25, 1904.

At the same meeting of the New York Academy of Medicine, Stengel pointed out the necessity of a prolonged convalescence-leave after any of the infectious fevers. Shattuck urged absolute abstinence from alcohol, and Stockton recommended vapor baths twice a week as part of general hygiene, in addition to iodides and small doses of nitroglycerin for long periods.

**ADRENALIN ARTERITIS.** When allowance is made for the divergence of the individual lines of research, one central fact remains, that of intrinsic hypertension, as the recognized antecedent. According to the latest views set forth by Marchand<sup>1</sup> and by Coplin,<sup>2</sup> the immediate cause of the morbid process is persistent intra-arterial overpressure and its "damaging effect upon the elastic membrane." Arterial thickening and sclerosis are elicited as local measures of protection, but they ultimately lead up to local and general degenerative changes. This theory of the pathology of the affection has received considerable support from the experimental production of lesions closely allied to arteriosclerosis by Josué<sup>3</sup> and by Erb by means of systematic injections of adrenalin. It is conceivable that the adrenals may be primarily concerned in setting up the presclerotic arterial pressure which had hitherto been attributed to toxic influences of a different order. This interpretation is consistent with the fact that abnormalities of the adrenals have been detected by Coplin in a series of cases of arteriosclerosis, and this is, as suggested in an editorial of the *Journal of the American Medical Association* (September 10, 1904), an additional reason for caution in the therapeutic use of adrenal preparations.

It is noteworthy that Josué<sup>4</sup> has satisfied himself by adrenalin intravenous injections in rabbits that the atheroma which results in them is a distinct affection differing from arteriosclerosis. He also found proof of excessive adrenal overaction in three patients who died with marked atheroma.

Attention should be called to the fact that *preliminary thyroidectomy* entirely obviated the atheroma in four rabbits systematically injected with adrenalin by Lortat Jacob and Sabaréanu.<sup>5</sup>

*Experimental Arteritis.* Rzentkowski<sup>6</sup> finds that some rabbits are more susceptible to adrenalin and die of acute dilatation of the heart and cedema of the lungs in a few days. In some of them localized areas of calcification are found without concomitant small-cell infiltration, which are, therefore, perhaps, not truly atheromatous. Other changes observed

<sup>1</sup> Munch. med. Woch., 1904, Nos. 17 and 18.

<sup>2</sup> Proceedings of the Pathological Society of Philadelphia, May, 1904.

<sup>3</sup> Presse méd., November 18, 1903

<sup>4</sup> Presse méd., 1904, No. 33.

<sup>5</sup> Sem. méd., November 16, 1904.

<sup>6</sup> Berliner klin. Woch., August 1, 1904.

are hypertrophy of the heart, cirrhosis of the liver, and renal congestion.

**THE DUCTLESS GLANDS AND ARTERIOSCLEROSIS.** The possible relation suggested in this heading is already a question of the day. If we could imagine ourselves to be acquainted only with those agents capable of influencing the state of the blood vessels which are among our most recent revelations, and not to be acquainted with any of the old vasoregulators, we might on this new basis alone evolve a fairly complete theory of hypertension, hypotension, and arteriosclerosis. A theory of this kind is supplied to us by Osborne<sup>1</sup> among advanced suggestions in etiology and in treatment based upon the well-known properties of the thyroid and of the suprarenal secretions. Too much of the one or too little of the other might explain the affection. And there would seem to be but a step to unilateral adrenalectomy or ligation of the suprarenal artery as a therapeutic counterpart to thyroidectomy which is already with us; but it is perhaps to be hoped that this development may be reserved for a distant future. Meanwhile, Osborne, who reminds us that the pituitary secretion acts like that of the suprarenal, only less strongly, and that the secretions of the thymus, the testis, and the ovary have vasodilating effects similar to those of the thyroid, discusses seriously the etiological question. For him the essential factor in disturbed tension is a faulty secretion of these glands; for instance, in the senile state of hypertension a relative deficiency of the thyroid and a relative excess of the suprarenal, and these faults can be partly remedied, for thyroid extract may be given or the gland stimulated by small doses of iodide. But we are familiar with causes which we had regarded as in themselves quite sufficient, the "contributory causes" of Osborne, old age, excess of food, of alcohol, of work, etc. These also need attention. Osborne takes a liberal view in his restrictions of alcohol and tobacco; in small doses these are vasorelaxants, but this effect can be secured by very weak doses of nitroglycerin,  $\frac{1}{400}$  grain, taken four times daily.

This belief of Osborne in an intervention of the thyroid and of the adrenal secretions as the intrinsic regulators of blood pressure when extrinsic agencies may have been credited with the result, is reflected in James Barr's address on "Arteriosclerosis."<sup>2</sup> Barr considers it probable that arterial hypertension and disease may evolve from adrenal overaction, especially if associated with thyroid inadequacy. But in discussing the interactions of cardiovascular tension and tone, he dwells upon the prominent influence of the quality of the blood. Alkalinity improves the tone; too much carbonic acid raises the tension. George Oliver's investigations on the circulation of tissue lymph have taught us that the

<sup>1</sup> New York Medical Journal, August 20, 1904.

<sup>2</sup> British Medical Journal, January 14, 1905.

purin bodies, whether oxygenous or endogenous, can serve a good purpose in the economy as they raise blood pressure by arteriolar contraction, but they can also wreck the circulation if their elimination should be imperfect.

FOR THE DIFFERENTIAL DIAGNOSIS OF ARTERIOSCLEROSIS, Erlenmeyer makes a good point in the contrast between simple neurasthenia and cerebral arteriosclerosis. He states that while the late symptoms of the latter are focal, the earlier ones are often indistinguishable from neurasthenic symptoms. The effects of temporary exertion, such as any straining, etc., are exactly opposite in the two conditions, intensifying the cerebral symptoms of arteriosclerosis, relieving those of neurasthenia.

THE TREATMENT OF ARTERIOSCLEROSIS. Nauheim baths, suitable only when the blood pressure is not very high, are regarded by Erlenmeyer<sup>1</sup> as the next best treatment after the iodides. He recommends equal parts of sodium and potassium iodide, given well diluted after meals every day, with 8 grains increase every fourth day till 80 grains are taken daily. This should be continued till 300 to 500 grains have been taken and shorter courses of the drug should be repeated every year or oftener. A drachm of sodium bicarbonate with each dose, and the avoidance of acid food are aids against iodism.

*The Hypotensive Effect of the Nauheim Bath* is greatly intensified, according to the observations of J. A. De Vries Reilingh,<sup>2</sup> by alterations . . . of an interrupted and of a continuous current passed through the bath. It does not appear, however, that the effect is lasting.

The treatment is discussed by J. M. Anders,<sup>3</sup> in its several etiological categories, under the headings of prophylaxis, which should begin in early life on the basis of a perfect nutritive equilibrium and of suitable exercise; of general treatment, with special regard to gout and to alcohol; of hygiene, particularly alimentary hygiene, needing always individual adjustment, and lastly, of medicinal treatment, in which the iodides and the nitrites play a leading part.

*Trunczek's Serum* has been injected with advantage by De Silvestri<sup>4</sup> in more frequent and larger doses than originally prescribed, namely, daily instead of twice a week, and with progressive increase up to 10 c.c. The invariable effect of the treatment has been to relieve excessive tension and its evil symptoms. No important results can, of course, be expected in the advanced stage of secondary cardiac dilatation.

*The Prevention of Apoplexy and of Cerebral Hemorrhage* is considered by Clifford Allbutt<sup>5</sup> not to be beyond the scope of practical therapeutics

<sup>1</sup> Deutsche. med. Zeit., Berlin, February 1 and 4, 1904.

<sup>2</sup> Sem. méd., January 11, 1905.

<sup>3</sup> Journal of the American Medical Association, September 17, 1904.

<sup>4</sup> PROGRESSIVE MEDICINE, June, 1904.

<sup>5</sup> Bristol Medical Chirurgical Society Journal, March, 1905.

in a proportion of cases, which, of course, do not include those of embolism and thrombosis, or of advanced kidney disease. His hopefulness is based upon a belief that in a large proportion of cases of apoplexy the kidneys are not granular, and that putting aside the more acute local arterial lesions arising from syphilis or leukæmia, the antecedent arterial degeneration is a dynamic result, the accumulated work of a thousand "obscure stresses." Its presence and the implied dangers might in most cases be foretold from the state of the pulse, and if thus recognized sufficiently early, the individual causes which lead up to the vascular degeneration might conceivably be remedied. Foremost among the latter are the excess and complication of our diet, the evil of alcohol, and the excess or deficiency of exercise. Every adult of the age of forty and upward should, according to Allbutt, have his blood pressure measured at regular intervals by means of the best instruments attainable; if persistent rise of arterial pressure is detected, he should revise his mode of life. The wisdom of the aim of this advice cannot be doubted. Neither can it be gainsaid, on the other hand, that the multiplication of the methods of diagnosis and of treatment "by machinery" has its drawbacks. The machine does its work, and its answer is mathematical; but the question was a *vital* one. It thus happens that in spite of its precision the instrumental result is at best an approximation, and that its chief and undoubted value lies in the faithfulness of its record under the more or less artificial conditions of the experiment, and its eliminating the grosser individual errors of observation.

More questionable is the moral effect upon the patients. Many are apt to trust blindly to any machine-made reply. It is to be feared that if Allbutt's recommendations were to be generally adopted a new nosophobia would arise analogous to that of the unfortunate "brittle" persons in lunatic asylums, and one of a specially pernicious and distracting kind, because the question as to life or death of the patient is exposed to the ever present temptation to consult his pulse. For the present the excellent advice to watch the pulse that we may ward off or delay cerebral catastrophes by sound rules of life should be addressed to the profession rather than to the public. Though earlier recourse should undoubtedly be had to the mechanical pulse gauge, the ominous ghost of arterial degeneracy should be carefully screened off from the scene of action.

The profession, after its efficient subjugation of disease, was in danger of losing its occupation; but Allbutt's invitation to the cultivation of longevity opens up a vast field for its continued activity. Among the illustrative results displayed by W. E. Dixon, of Cambridge, were the remarkable observations of Kocher and Cushing on the enormous increase of pressure set up during compression of the brain, in order to counteract the emptying of the vessels of the medulla by intracranial pressure. The danger

of bleeding in apoplexy had thus been made manifest by those observers.

Allbutt's paper has brought up collaterally for renewed discussion a set of awkward questions as to the clinical and pathological etiology of arteriosclerosis and of its results; the renal question between "toxic" and "pressure;" the dietetic question between "overfeeding" and "tissue starvation;" the dynamic question between excess and defect of "tissue activity." The allotment of the share attributable to blood pressure *per se* is complicated by these exceptional instances of arterial degeneracy, which remain free from any high arterial pressure; just as some cases of granular kidney remain free from high arterial tension and from cardiac hypertrophy. These are the cases which may supply the most likely material for a successful study of the problem.

*A Search for Checks against the Decay of Age* seems to have sprung up under the stimulus of Metchnikoff's sanguine forecast, and of Sir Hermann Weber's practical suggestions for the prolongation of life. Bradford C. Loveland<sup>1</sup> publishes his efforts to limit the progress and the consequences of arterial disease in three of his patients, two of whom suffered in the cerebral; the third in the coronary circulation. All three did well, one of them on pure hygiene, another on cool baths, moderate exercise, regulated diet, strychnine and green iodide of mercury; the third on electricity, a morning draught of sodium phosphate, and three daily doses of well-diluted sodium salicylate and benzoate.

Even mild forms of treatment such as these may not be without their efficacy; but the iodides so long upheld as the *sine qua non* have received additional support from Romberg's<sup>2</sup> observation that iodine renders the blood less viscous, even in relatively small doses, providing there be a due avoidance of acid ingesta. Subcutaneous injections of iodine are a good substitute should the stomach prove intolerant. While strongly to be recommended for the treatment of the arteries, as in early cerebral arteriosclerosis, mild angina, intermittent claudication, etc., iodine is a danger to the cirrhotic kidney, which so often coexists; and in cases of Graves' disease it is also a danger to the heart.

*Decalcification of the Arteries* sounds plausible as an aim in treatment, yet even in this matter we know too little to pronounce it to be wise. Our chief store of calcium, that of the skeleton, does not need any reduction, and the question will arise whether the physiological or the pathological phosphates would be the first to dissolve away. This uncertainty is one of the reasons why E. Oberndoerffer's<sup>3</sup> demonstration by experiments

<sup>1</sup> New York Medical Journal, September 10, 1904.

<sup>2</sup> Deutsche med. Woch., 1904, Bd. xxx., No. 48.

<sup>3</sup> Berliner klin. Woch., October 10, 1904.

upon himself of the activity of quinic acid in exporting lime through the intestinal mucous membrane, must remain for the present without its practical application.

**Angina.** The contribution to the subjects of angina pectoris and arteriosclerosis from William Osler's<sup>1</sup> pen affords us the accustomed interest and instruction. *Pain* in arteriosclerosis may be in the head or in the abdomen, and in both regions it is most severe in association with thrombosis. In the extremities there may be simple paræsthesia, numbness, and tingling, or else painful cramp, which may be so severe as to deserve the name "angina cruris;" or again, intermittent claudication, which is usually uncomplicated by pain; or lastly, erythromelalgia.

In the heart the pain is *sui generis* and suggests something distinctive superadded to arteriosclerosis itself. Four groups of cases may be differentiated; 1. The *neurotic angina* of young persons, which rarely may be fatal, and is not due to any coronary or arterial lesion. 2. The *syphilitic angina* of young men incidental to arteritis, coronary or aortic, and sometimes curable by iodide of potassium, though it may develop into aneurysm of the first portion of the arch. 3. The *presenile angina* of the majority of cases, which is part of a widespread arterial degeneration. 4. The *senile angina* occurring after seventy, as a terminal climax of the arteriosclerotic decay.

*Cardiac Lesions following Angina Pectoris*, including pericarditis, are described by V. M. Kernig.<sup>2</sup> He urges absolute rest for days or even for weeks after an attack, as the best means of obviating a catastrophe.

**Bradycardia, its Symptoms and its Treatment** are too extensive a subject for discussion in these pages, but they are exhaustively treated by G. A. Gibson.<sup>3</sup> Gillies<sup>4</sup> also deals with the Stokes-Adams' syndrome, for which no satisfactory treatment has yet been discovered; but amyl nitrite, nitroglycerin, and the inhalation of oxygen afford some relief.

**The Adams-Stokes Affection** will yield up its mystery all the sooner if cases are studied and discussed as thoroughly as that reported by Clarence Quinlin.<sup>5</sup> The condition owes its name and recognition to Adams (1827) and Stokes (in the fifties). Later Cornil (1875) and Handfield-Jones (1876) also reported cases. In 1893 H. Huchard attempted its pathological explanation. In addition to these papers the "affection" is based on a succession of contributions by Balfour (1894), Edgren (1898), His (1899), Hoffmann (1901), Edes (1901), Cassirer (1901), L. Krehl (1901), Luce (1902), Jaquet (1902), Lewy (1902), Osler (1903),

<sup>1</sup> Journal of the American Medical Association, September 17, 1904.

<sup>2</sup> Rousky Vrach, October 30, 1904.

■ ■ ■ <sup>3</sup> British Medical Journal, October 8, 1904.

<sup>4</sup> Montreal Medical Journal, June, 1904.

■ ■ ■ <sup>5</sup> Journal of the Association of Medical Sciences, September, 1904.

and Ortnier (1903) is now clearly defined, and is known by the association, in elderly subjects, of bradycardia, which may be only recurrent but usually is permanent, with attacks of unconsciousness and of apoplectic or epileptiform symptoms. The condition has been ascribed by Huchard to the cardiobulbar type of arteriosclerosis. Various circumstances suggest the co-operation of a vasomotor factor, particularly the occasional aura of "blood rushing" to head or limbs, the invariable slowing and sometimes cessation of the heart pulse, the warding off of some of the minor attacks by posture (recumbency or lowering the head), and the provocative influence of emotional stress.

If, as held by Belski (1902), the occurrence of "heart-block" at Gaskell's bridge, across which normally motor impulses are conveyed from auricle to ventricle, is evidence of incipient decay of the myocardium, much light is thrown upon associated anomalies, such as that of "auriculoventricular asynchronism," with independent and relatively frequent auricular beats perceptible in the jugular, described by His; and of the "pseudohæmisystole," described by Hoffmann, a form of arrhythmia which, by the way, may, according to Dehio, be traced by the action of atropine to either a "mural" or to a "vagus centre" causation, this drug synchronizing the cardiac and radial pulse by suspending the vagus influence.

The policy suggested by this combination of structural degeneration and of functional excitability is "non-interference," except in one direction, that of easing, if possible, the work of the heart by rest and the typically exaggerated arterial pressure by small doses (20 grains daily) of iodide of potassium, by oxygen inhalations (up to 30 litres daily), and avoidance of tea, coffee, tobacco, and digitalis, or any other pressor agent. Together with suitable hygienic and climatic measures, these are the chief indications. In my own experience, passive muscular exercise and massage of the skin and abdomen are essential adjuncts to absolute rest, and much attention should be given to the selection of a suitable diet.

The special service rendered by Quinlin's paper lies in the long-continued observations of the blood pressure in his case. The anomaly that this should be so constantly high (170 to 250 mm.) while the heart is admittedly feeble, and that at the same time the great arteries of the limbs should be elastic, and, moreover, that exercise should invariably raise the blood pressure and rather slow still further the heart rate instead of raising it, tempt him to consider whether those may not be right who like K. Hasebroek,<sup>1</sup> believe in the co-operation with the heart of a secondary peripheral rhythmic motor mechanism for the circulation, that of the vessels and capillaries. These rather advanced speculations might

<sup>1</sup> Deutsche Arch. f. klin. Med., 1903, Bd. lxxvii.



(it may be suggested with difference) be less needed than it appears if the high-pressure values in question should prove to have been determined exclusively with the Riva-Rocci sphygmometer, an instrument which we should not forget records the maximal pressure of the pulse wave, not the mean pressure within the artery. In bradycardia this wave needs to possess considerable size, as well as pressure, if circulation is to be kept going, in spite of the long intervals between beats.

In conclusion, Quinlin's paper points the way for investigations in one of the most elaborate "set experiments" for research with which clinical pathology has ever presented physiology. The facts displayed in the course of Adams-Stokes' affection, when thoroughly analyzed, will prove to be the key to more than one of the problems of the circulation.

**Paroxysmal Tachycardia** is best treated, according to James Barr,<sup>1</sup> by rest in bed, the nitrites, counterirritation over the heart, and a dry diet, with suitable purgation. He insists upon the value of deep respirations as promoting freedom of the pulmonary circulation.

**Intermittent Claudication or Dysbasia Angiosclerotica** was described in 1856 by Charcot, in connection with arteriosclerosis; later cases were published by Leyden (1874) and Erb<sup>2</sup> (1876). Last year<sup>3</sup> the latter contributed 45 additional instances (including typical cases), in some of which the paræsthesia and fatigue of the limb on overexertion did not culminate in absolute loss of power. The typical symptoms are described in the following words by Arthur Patek;<sup>4</sup> "After walking with comparative ease for a few minutes, the patient suddenly experiences a sense of weight and cramp-like pain in the legs; then they give way underneath him, and he falls to the pavement. After a few minutes' rest he recovers, rises, and goes home." Most cases are bilateral, with considerable sclerotic obstruction of all four arteries of the foot; but in some instances the ischæmia is apparently of spastic production (Erb). Most sufferers are men past forty, by nationality Russians or Jews. The influence of tobacco partly explains the difference between the sexes. Charles W. Burr<sup>5</sup> also describes an interesting case of this affection, which, it may be added, seldom attacks the arms.

**Blood Pressure in Relation to the Heart.** **VASCULAR-TONE TEST.** *The "Digitocapillary Phenomenon,"* described by M. H. Ferrannini,<sup>6</sup> is utilized by him, in conjunction with the character of the second aortic sound, as a test for the diagnosis of increased or diminished vascular tonus. The method consists in obtaining a plethysmographic tracing of the variations

<sup>1</sup> Lancet, July 16, 1904.

<sup>2</sup> Munch. med. Woch., 1904, vol. li., No. 21.

<sup>3</sup> PROGRESSIVE MEDICINE, September, 1904.

<sup>4</sup> Medical News, December 3, 1904.

<sup>5</sup> American Medicine, September 17, 1904.

<sup>6</sup> Italian Congress, Sem. méd., November 2, 1904.

in the size of the distal phalanx as a result of alternately tightening and loosening a tape around the finger, and in noting the presence or the absence of any delay in the alternate production of ischæmia and of hyperæmia. Aortic accentuation coinciding with much delayed ischæmia and hyperæmia indicates the highest degree of vascular hypertony, while a less marked degree of the latter is revealed by a delay in the production of ischæmia only. When the delayed ischæmia is accompanied with abnormal rapidity in the occurrence of hyperæmia, vascular hypotony is present. Undue rapidity of both events, associated with a feeble second sound, corresponds to higher degrees of vascular hypotony. This method has enabled him to demonstrate the unsuspected frequency with which a vasodilatation is combined with arteriosclerosis.

THE DIAGNOSIS OF ARTERIOSCLEROSIS would be greatly facilitated, according to Lihle's clinical experiments,<sup>1</sup> if arterial blood pressure were always studied not in one, but in two arteries of different degree. Thus he compares the radial and the digital arteries. The normal difference between them should be from 30 to 40 mm. In confirmed arteriosclerotics it ranges from 60 to 120 mm. The very high pressure, even to 150 mm. Hg., is not, as alleged by Z. Basch, distinctive, though it is a preliminary stage in the affection. A practical point of importance is that, although arteriosclerosis in the arms means certainly arteriosclerosis elsewhere, the converse is not true. The reflex neurosis of angina pectoris is a vascular spasm which does not exclusively belong to arteriosclerosis.

THE DIVERSITY OF PRESSURE GAUGES AND GAUGING METHODS render most valuable C. J. Martin's criticism<sup>2</sup> of their technique, and the guiding principles which he lays down with so much clearness. His remarks should be read by all students of blood pressure. From careful experimental determination of the pressure absorbed by the vessel wall itself, he concludes that the external pressure necessary to obliterate an artery is a valid indication of the internal pressure in health within 2 mm., and that in extreme cases of sclerosis about 7 mm. must be deducted from the observed external pressure.

He has tested two distinct groups of instruments: (a) those in which the pressure is applied only over a superficial artery and its immediate surroundings, Vierordt,<sup>3</sup> von Basch,<sup>4</sup> Hill and Barnard<sup>5</sup> (small instrument), Oliver;<sup>6</sup> and (b) those in which the pressure is applied by a bag completely surrounding the limb or finger, or enclosing fingers, or the whole

<sup>1</sup> Wiener klin. Woch., April 7, 1904.

<sup>2</sup> British Medical Journal, April 22, 1905.

<sup>3</sup> Die Lehre von Arterienpuls, Braunschweig, 1855, p. 164.

<sup>4</sup> Loc. cit.

<sup>5</sup> Proceedings of the Physiological Society, Journal of Physiology, 1898, vol. xxiii. p. 4.

<sup>6</sup> Journal of Physiology, 1897, vol. xxii. p. 51.

hand and forearm (plethysmograph); Riva-Rocci,<sup>1</sup> Hill and Barnard<sup>2</sup> (large instrument), Gärtner,<sup>3</sup> Mosso,<sup>4</sup> Marey.<sup>5</sup> The small instruments in group (a), one of which (von Basch) compresses the artery till the pulse beyond is obliterated, while with those of Hill and Barnard and of Oliver the mean pressure is determined by taking the reading at which the maximum oscillation is seen, give often considerably higher values than those in group (b) and are less reliable. The plethysmographic method (Marey,<sup>6</sup> Mosso)<sup>7</sup> is a purely laboratory method.

But Riva-Rocci's<sup>8</sup> manometric method, with its rubber cuff for obliterating the palpable pulsation, and Hill and Barnard's<sup>9</sup> aneroid manometric method, with its encircling inflated india-rubber tube for the determination of the maximum oscillation as a guide to the mean pressure, are very fairly accurate (Riva-Rocci's, with an error of less than 4 per cent. varying with the individual tactile discrimination), provided (1) that the encircling pressure collar be not too narrow and (2) that the two free ends of it should overlap, failing which too high a reading is obtained.

Martin's special modification of Riva-Rocci's manometer is described,<sup>10</sup> and he mentions Sahli's "shortened pattern." Gärtner's ring sphygmometer for the finger, with which the blanching pressure has to be determined, is very convenient, but its ring is too narrow to avoid giving too high an estimate, and its "end-point reaction" is less delicate than that of the Riva-Rocci's, which it resembles in general description.

The maximum systolic pressure is the only point during the cardiac cycle which can be determined with accuracy without opening the artery. This conclusion is based upon the evidence of experiments specially undertaken by Martin with reference to this point. The position of the maximum oscillations is subject to variations which may introduce error, although in a general way Hill's contention is correct that they generally occur (in the Riva-Rocci instrument) about the mean pressure.

Theodore C. Janeway's modification<sup>11</sup> of Riva-Rocci's sphygmomanometer adds the advantages of portability and durability to those of accuracy and ease of working. Compactness and portability are also claimed by Henry W. Cook for his own pattern of Riva-Rocci's instrument, the only one besides Janeway's and Stanton's manufactured in America. With its help he has arrived at the following conclusions in relation to chronic arterial hypertension:<sup>12</sup> Etiological classes: chronic, etc.

<sup>1</sup> Gazz. Medica di Torino, 1896, 1897.

<sup>2</sup> Lancet, 1898, i. p. 282.

<sup>3</sup> Wien. med. Woch., 1899.

<sup>4</sup> Arch. Ital. de Biol., 1895, vol. xxiii.

<sup>5</sup> Travaux du Laboratoire, 1880, vol. iv. p. 253.

<sup>6</sup> Ibid., 1876, vol. ii.

<sup>7</sup> Loc. cit.

<sup>8</sup> Loc. cit.

<sup>9</sup> Lancet, 1898.

<sup>10</sup> Loc. cit., p. 868.

<sup>11</sup> Medical News, August 27, 1904.

<sup>12</sup> Journal of the American Medical Association, January 28, 1905.

Chronic hypertension may be divided into four classes, according to etiology; (a) arteriosclerotic; (b) cardiac, pulmonary, and cerebral compensatory; (c) toxic; (d) primary. The primary form of hypertension deserves recognition as a distinct disease. Its early treatment should avail to delay some forms of cardiovascular and renal disease. In correcting hypertension sodium nitrite has many advantages over nitroglycerin.

H. Sahli's<sup>1</sup> pocket mercury manometer is a welcome addition to the clinical arsenal; for, besides being portable, it can be connected with Riva-Rocci's, Gaertner's, or Basch-Potain's instruments.

MEASUREMENT OF THE DIASTOLIC BLOOD PRESSURE, in addition to the systolic, is part of the method described by J. Strasburger,<sup>2</sup> which needs to be studied in the original. He calls to aid the palpating finger instead of the manometer.

PRACTICAL POINTS IN CONNECTION WITH BLOOD PRESSURE. To secure the desired reduction of high tension, von Noorden<sup>3</sup> recommends the 5 per cent. alcoholic solution of nitroglycerin in preference to the tablets which are often inert. He has given as much as  $\frac{1}{2}$  grain of nitroglycerin in twenty-four hours.

Robert H. Babcock<sup>4</sup> recommends attention to the pulse tension rather than the pulse rate, as a guide for the life insurance examiner.

Different positions of the body influence blood pressure and pulse rate, and O. Z. Stephens<sup>5</sup> research has brought out the following points among other results; 1. The blood pressure increases in the brachials from the standing to the head-down positions, inclusively, in the following order: Standing, sitting, left lateral, right lateral, supine, and head-down. 2. The pulse rate decreases in the same order that the blood pressure increases. 3. The decrease in the pulse rate is a conservative act on the part of nature to protect the heart itself and the central nervous system.

THE FACTORS OF BLOOD PRESSURE. Cabot's<sup>6</sup> concluding paragraph is full of practical significance: "To me one of the most striking features of the investigation was the fact that while strychnine and whiskey seemed to be entirely without influence upon the blood pressure, the sight of the dinner tray or the prospect of getting up produced a most obvious, though transient, rise in the pressure. The only permanent gains in pressure occurred when the patient reached a crisis (as in pneumonia) or when convalescence enabled him to get up and walk." No physician can afford to neglect the psychical element in treatment; it may at times

<sup>1</sup> Deutsche med. Woch., 1904, Bd. xxx., No. 48.

<sup>2</sup> Zeit. f. klin. Med., Bd. liv., Heft 5 and 6.

<sup>3</sup> Journal of the American Medical Association, October 22, 1904, p. 1237.

<sup>4</sup> Medical News, April 23, 1904.

<sup>5</sup> Journal of the American Medical Association, October 1, 1904.

<sup>6</sup> New York and Philadelphia Medical Journal, July 9, 1904.

be more potent than any drug and the food that suits the fancy may be food indeed for the heart. This also throws light upon the collateral value of common salt at meals, which Oliver contends acts chiefly as a raiser of blood pressure, not improbably by pleasing the palate.

**CONSTITUTIONALLY LOW ARTERIAL TENSION**, the "hypertension" of Huchard, is doubtless, as felt by Louis F. Bishop,<sup>1</sup> an important peculiarity to recognize and to bear in mind in any line of treatment we may recommend. Defective nervous control is among the symptoms noted by Bishop. His experience is in favor of systematic exercise rather than medicine.

**BLOOD PRESSURE IN ARTERIOSCLEROSIS** was not found to be invariably high by T. Dunin<sup>2</sup> in 440 cases examined with Gaertner's sonometer. It was normal or below normal in 120, and in 80 cases with low blood pressure anginal symptoms occurred. Quick pulse or even tachycardia prevailed in 40 out of 136 cases of high pressure; he regards this combination as leading up to symptoms of failure.

**HYDROTHERAPY IN ARTERIAL HYPOTENSION AND HYPERTENSION.** Both conditions De Laussedat finds<sup>3</sup> to be favorably influenced by "carbogaseous" baths provided the mode of their administration be varied to suit the condition; but a general reservation is to be made in regard to cases of decided arterial rigidity. In hypotension the indication is a bath of sufficient duration and of temperature equal to that of the skin, gas being withheld at the beginning and gradually increased. In hypertension very short and very gaseous baths are to be used at first, greater advantage being gradually gained by prolonging their duration. The diuresis, which is always observed, is important, as it represents an anti-toxic and excretory element of treatment.

Béni-Barde's<sup>4</sup> considerable experience in practical hydrotherapy gives weight to his remarks on its uses from the special standpoint of the vasomotor system. In neurasthenia the spray bath, with an initial temperature of 92°, to 99° is to be applied, with the avoidance of any shock, to the spine first (from above downward), next to the anterior surface of the trunk, and lastly to the trunk, for four to eight minutes, the objects being sedation and the promotion of sleep. But when the purpose is to stimulate, the temperature of the spray is varied through many degrees, great care should be taken, in all cases where cardiac symptoms exist, to avoid the application to the chest of any but the lightest touches of the cold douche, and to resort always to the soothing effect of the warmer current whenever any signs of overstimulation become apparent.

<sup>1</sup> Journal of the American Medical Association, June 25, 1904.

<sup>2</sup> Zeit. f. klin. Med., Bd. liv., Heft 5 and 6.

<sup>3</sup> Bull. Acad. de méd., 1904, No. 25.

<sup>4</sup> Journal des praticiens, 1904, No. 21.

THE MECHANISM OF THE ADRENAL EFFECT UPON VASCULAR TONE needs further elucidation. James Barr,<sup>1</sup> who uses adrenalin as a vascular tonic, and for checking secretions from serous membranes, believes "that while adrenalin acts chiefly on the nerve endings, it has a direct effect on the unstriated muscular fibre, and is much more constant in its action than agents which act only through the vasomotor mechanism. It blanches fresh granulation tissue where there is no sympathetic nerve, and, perhaps not larger bloodvessels than newly formed capillaries."

Oliver and Schäfer's original conclusions were in favor of a direct action upon unstriated muscle. But R. T. Elliott, of Cambridge (quoted by Barr), has recently convinced himself experimentally that adrenalin only acts through the sympathetic nervous system. According to this, adrenalin would not take effect upon the coronary arteries (in cat, dog, or rabbit), nor upon the cerebral arteries (Leonard Hill), nor upon the pulmonary (Dixon), which are stated to be devoid of vasomotor nerves.

INTERRUPTED CIRCULATION. A therapeutic method of which I published a preliminary account in the *Lancet* of August 13, 1904,<sup>2</sup> consists in the systematic use of the elastic tourniquet to produce alternate anæmia and arterial hyperæmia. A good illustration of its effects was obtained in two cases of rheumatoid arthritis, but as that affection does not belong to the scope of this report, the reader is referred to the original or the abstracts. The same principle, which contrasts with that underlying Bier's "passive venous hyperæmia," explains the mechanism of the cure of a case of Reynaud's disease by Harvey Cushing by the elastic tourniquet, which was briefly noticed in *PROGRESSIVE MEDICINE* for September, 1904, p. 165.

<sup>1</sup> British Medical Journal, January 14, 1905, p. 56.

<sup>2</sup> Therapeutic Gazette, 1905, p. 50.

# DERMATOLOGY AND SYPHILIS.

By WILLIAM S. GOTTHEIL, M.D.

## DERMATOLOGY.

**Actinotherapeusis.**—This new method of treatment has received fairly thorough consideration in PROGRESSIVE MEDICINE during the last few years, and very satisfactory positive results have been recorded from experimentation done in various parts of the world.<sup>1</sup> It would serve no useful purpose to notice all the articles that have appeared during the past year; I shall mention only a few. The most important is in the form of a report from the Finsen Institute<sup>2</sup> at Copenhagen, which consists of a long and very convincing series of “before and after” pictures of cases of lupus vulgaris treated by the method. Unlike many similar medical pictures, these are very evidently bona fide photographs of the same cases at intervals of a year or more; they show the natural changes of feature, clothing, hair-dressing, attitude, etc., that is to be expected in pictures of the same person taken at long intervals of time. We must necessarily accept this evidence of the efficacy of the treatment. Nevertheless I do not think that the method has made any very great progress toward general acceptance during the past year. The reason for this is twofold.

In the first place its application has practically been confined to the treatment of *lupus vulgaris* and *tuberculosis cutis*. It does not seem to have proved very much superior to other methods in the various forms of alopecia, parasitic disease, rosacea, nævus, etc. I myself reported three cures of lupus erythematosus some time ago;<sup>3</sup> in one of these the disease subsequently reappeared. The cases that I have encountered during the last twelve months have all been unsuited for the treatment; either the circumstances have been such that a long and expensive course could not be undertaken, or the disease has been so widespread and disseminated in so many foci that it was out of the question to give the necessary attention to each one of them. And as the various forms of tuberculosis of the skin are not very common here, but few investigators have been at work.

<sup>1</sup> PROGRESSIVE MEDICINE, September, 1903, 1904.

<sup>2</sup> Die Bekämpfung des Lupus Vulgaris; Finsen, 1903.

<sup>3</sup> International Journal of Surgery, October, 1903.

The second reason is of greater moment. The treatment is expensive in every way. The apparatus is costly; the amount of current used is large; the sessions must be long, frequently repeated, and continued for lengthy periods. Hence, it is not suited for the physician's office and for the ordinary patient. Several patients that I have seen during the past year have preferred to go to Copenhagen for treatment; they have felt that if it does require so large an expenditure of time and money they preferred to take a vacation and a trip abroad with it. Only wealthy people can undertake the Finsen treatment in private practice. It is essentially an institution method, and America is far behind the European countries in this respect. There are flourishing Finsen Institutes in most of the European capitals. Lupus is serious enough, the cases are numerous enough (there being far more of them than is generally supposed), and the remedial measure well enough established to warrant the foundation of Finsen Institutes here.

Marie<sup>1</sup> describes a new apparatus for the light treatment, which, however, does not seem to possess any especial advantages over those already in the market. Kellermann<sup>2</sup> reports good results in 35 cases of various dermatoses and nervous affections; he claims to have had especially good effects in eczemas and neuralgias; the healing of chronic leg ulcers was markedly hastened. Roger<sup>3</sup> has employed the treatment in various affections of the genitals, chancres, herpes, and chancroidal and phagadænic buboes with good results; but his method was really a cauterizing one, since he uses a 300-candle-power light at a distance of two or three inches. Pospelow<sup>4</sup> showed a case of that very recalcitrant affection, psoriasis of the nails, at the Moscow Venereal and Dermatological Society on March 4th, of five years' standing, and in which the usual internal and external treatment had been entirely ineffective. There was very marked improvement after a few light baths, together with paintings of 5 per cent. chrysarobin traumaticin. Britschew<sup>5</sup> cured a case of general psoriasis with seventeen light baths (cabinet). Torök and Schein<sup>6</sup> advocate actinotherapy in severe and obstinate cases of acne. It has no antiparasitic effect, they say, but it diminishes the sebaceous secretion from the increased cornification of the parenchyma that it occasions. Montgomery<sup>7</sup> saw improvement in an extensive case of vitiligo from its use. Other similar reports have been published by François,<sup>8</sup> Carle<sup>9</sup> and others.

<sup>1</sup> *Annales de dermatologie et de syphiligraphie*, May, 1904.

<sup>2</sup> *Centralblatt f. die gesammte Therapie; Dermatologisches Centralblatt*, March, 1904.

<sup>3</sup> *Ibid.*

<sup>4</sup> *Dermatologisches Centralblatt*, March, 1904.

<sup>5</sup> *Ibid.*

<sup>6</sup> *Wiener klin. Rundschau; Journal of Cutaneous Diseases*, March, 1904.

<sup>7</sup> *Monatshefte f. praktische Dermatologie*, March, 1904.

<sup>8</sup> *Ibid.*, November 15, 1903.

<sup>9</sup> *Ibid.*



The only important novelty in methods proposed during the year has been the attempts to sensitize the tissues to the light rays according to the method of Dreier. Spiethoff,<sup>1</sup> as the result of his experiments made on 6 lupus cases in Lesser's clinic, reports adversely to it. But Tappeiner<sup>2</sup> has obtained good results in cancerous and other growths by the use of a 1 per cent. eosin solution to enhance the actinotherapeutic action. Neisser and Halberstaedter<sup>3</sup> used a 1:1000 erythrosin solution by superficial or deep injection in 23 cases, treating the parts with the light two to five hours later. They claim to have secured a more marked reaction and a much deeper effect.

Perhaps the most important paper of the year is the report made by Forchhammer and Reyn<sup>4</sup> to the Fifth International Dermatological Congress, held at Berlin in September of last year. They conclude as follows:

1. There have been no especially advantageous results from the employment of iron electrodes, as proposed by Bang and others.

2. It is by far the best possible treatment for lupus vulgaris and all other forms of cutaneous tuberculosis.

3. It effects improvement in (a) lupus erythematosus, but is less certain in its action here than in lupus vulgaris, and is ineffective in the inflammatory cases. (b) It is perhaps useful in superficial epitheliomata. (c) It is serviceable in rebellious cases of acne vulgaris, especially in connection with the local use of sulphur. (d) In rosacea it is beneficial only when there is coincident infection; scarification and galvanopuncture are also needed. (e) In keloid they noted a favorable result in one case only. (f) In alopecia areata it prevents extension in recent cases, but does not prevent relapses. (g) In flat angiomas it causes paling and improvement; there are no scars, but long treatment is required. (h) In other dermatoses the results are still undecided.

In the discussion that ensued Schiff stated that he had been working of late with mercury arc electrodes, which he believed transformed one-third of all the energy into ultraviolet rays. Lesser emphasized the fact that mere tediousness was an argument of but little weight in a disease like lupus, in view of the results attained. Von Düring had gotten good results in rosacea, and held that the Bang electrodes were not so good as the original Finsen model of instrument. Scholtz had cured alopecia areata by the method.

<sup>1</sup> Berliner klin. Wochenschrift; Journal of the American Medical Association, August 27, 1904.

<sup>2</sup> Münchener medicinische Wochenschrift; Journal of the American Medical Association, July 30, 1904.

<sup>3</sup> Deutsche medicinische Wochenschrift, 1904, No. 8.

<sup>4</sup> Annales de dermatologie et de syphiligraphie, October, 1904.

**Bromide Eruptions.**—The ordinary pustular acne from bromides is, of course, familiar to us all; it is so common that there are authorities that claim that it appears to some degree in 75 per cent. of all cases in which the drug is administered.<sup>1</sup> But even the more unusual forms are of not very infrequent occurrence; and they are of importance from the fact that they are not infrequently wrongly diagnosed and, hence, improperly treated.

The crusted variety like that recorded by Wallhauser and noted in the review of 1903<sup>2</sup> is perhaps the next in frequency; and the experience of the last few years would lead me to believe that the tuberos and vegetating form is not very uncommon. I see a case or two every year. The fleshy pink, tuberos excrescences are very characteristic; they resemble no other dermal lesion, and once seen and recognized can hardly be mistaken. I append a picture (Fig. 13) of one of my cases.



Bromoderma pustulosum  
(Author's case.)

Myers<sup>3</sup> has lately reported a typical case; and he also notes the occurrence of a varicella-like eruption from the same drug. Hallopeau and Teissiere<sup>4</sup> showed a case before the French Society of Dermatology and Syphilis on May 5th of last year in which extensive gangrene of the skin occurred as a complication of bromoderma.

As is so often the case with dermatoses, treatment is very simple when the correct diagnosis is made. The bromide must be stopped at once, and altogether, since a very small amount of the drug may cause the eruption. I have known it to appear after three two-grain doses only. A 5 per cent. salicylic acid-zinc dusting powder, or a salicylic acid paste can be used, which gradually causes the fleshy excrescences to shrivel up. In obstinate cases the lesions may be curetted under local anæsthesia before using the powder or the ointment. In the course of time they disappear entirely, leaving

<sup>1</sup> PROGRESSIVE MEDICINE, September, 1903, p. 124.

<sup>2</sup> Ibid., p. 123.

<sup>3</sup> Journal of Cutaneous Diseases, May, 1904.

<sup>4</sup> Annales de dermatologie et de syphiligraphie, May, 1904.

only a stain that gradually fades away. Treatment must be persisted in for many weeks; for results without scarring and deformity can only be attained slowly.

**Dermatitis Atrophicans.**—It appears that in certain cases atrophic changes of the skin may occur in consequence of the x-ray treatment. Schmidt<sup>1</sup> has seen it on the hands after a single but prolonged exposure (half an hour). There was first the ordinary dermatitis, followed by a bluish discoloration, and finally a permanently atrophic and wrinkled condition of the skin was left. The trouble is that we have no criteria to warn us of the probable onset of this very undesirable effect of the treatment. Other similar cases have been reported; and I have seen a number of cases in which the skin was left dry, wrinkled, and telangiectatic after the use of the rays.

Lehmann<sup>2</sup> has made an histological study of the condition; and Ravogli<sup>3</sup> records a case of his own in which the inflammatory symptoms, as evidenced by the reddish-brown, erythematous lesions at the advancing margins of the disease, were marked. In the review of two years ago<sup>4</sup> I called attention to the inflammatory process that marks the advancing margin of the disease in most of the cases. I expressed the opinion that these cases in their earliest stages would naturally be taken for instances of simple erythematous eczema; since it takes a long time, usually some years, before the atrophic changes become marked.

Pissonany's case<sup>5</sup> is characteristic; the patient was a woman, aged seventy years, and the disease had begun thirty years before with red, spreading spots. It belongs, like most of them, to Mestschersky's type of erythematous idiopathic atrophy of the skin. Cases that are not thus inflammatory in the beginning and at the advancing margin of the disease, but are purely atrophic throughout, belong to a different class; and those in which the characteristic lardaceous infiltration is present, with consecutive atrophy only, are better classed as scleroderma.

Mestschersky,<sup>6</sup> after a careful study of a case, concludes that it is a chronic dermatitis in the beginning, though in some cases the redness and infiltration is barely noticeable. He considers the disease the same as the erythromelia of Pick and the chronic acrodermatitis of Herxheimer. Here, as in many other instances, dermatology is unfortunately suffering from a plethora in terminology, to the confusion of the student and investigator.

<sup>1</sup> Dermatologisches Centralblatt, May, 1903.

<sup>2</sup> Inaugural Dissertation, Leipzig; Monatshefte f. praktische Dermatologie, November 1, 1903.

<sup>3</sup> Journal of the American Medical Association, June 10, 1903.

<sup>4</sup> PROGRESSIVE MEDICINE, September, 1903, p. 121.

<sup>5</sup> Archiv f. Dermatologie und Syphilis, August, 1903.

<sup>6</sup> Dermatologisches Centralblatt, June, 1904.

Riehl,<sup>1</sup> in his consideration of idiopathic atrophy of the skin, does not feel certain that inflammation invariably precedes the atrophy, though this is usually the case. He claims that there is a stage of diffuse, non-inflammatory infiltration, which would certainly make the affection very difficult to differentiate from scleroderma.

Fordyce<sup>2</sup> accepts the fact that the atrophy is the terminal stage of a primarily inflammatory condition. The case on which his study is based showed profound involvement of the nervous system; it seems probable that syphilis was the cause of this latter, and possibly of the skin lesions as well. Clinically, however, the case was indistinguishable from other instances of idiopathic atrophy; and this opens up an interesting field of study as to the etiology of this obscure affection.

One fact, however, we can regard as established; and that is that, in the majority of the cases at all events, the atrophy is not idiopathic at all, but is consequent to inflammatory changes, possibly of specific origin. The mistake arose from the fact that the first cases described were old ones of long standing, in which the retrogressive changes formed almost the entire picture of the existing disease. Idiopathic atrophy is, therefore, an unsuitable designation, and dermatitis atrophicans seems at present the best name for the condition at our disposal.

**Diet in Dermatoses.**—Under this heading Lassar<sup>3</sup> has written a noteworthy article. The subject is one of importance, as our patients appreciate when they inquire about it, as they often do; but the physician usually dismisses it with a word. It is entirely too large for any exhaustive consideration here; but I may call attention to a few of the author's salient points.

It is held by many that meat, more especially when freely indulged in by persons of sedentary habits, has a bad effect in psoriasis; and I may add that the more chronic forms of eczema and seborrhoea come in the same category. Cheese is apparently a direct cause of certain dermatoses, notably furunculosis, and should always be avoided in this condition. I have met with more than one instance in which indulgence in even the smallest amount of this food was immediately followed by the outbreak of a crop of pustules. It should, therefore, be prohibited in this as in all the other acute pustular dermatoses. All the erythematous and acute exudative rashes are benefited by restriction of diet; in bad cases a modified or purely milk diet is an important part of the treatment. These maladies being largely dependent on or influenced by intestinal autointoxication, they are benefited, in addition to the regulation of the food, by calomel purgation followed by salines, and by the

<sup>1</sup> Archiv f. Dermatologie und Syphilis, May, 1904.

<sup>2</sup> Journal of Cutaneous Diseases, April, 1904.

<sup>3</sup> Dermatologische Zeitschrift, 1904, No. 3.

administration of salicylic acid, which acts as an antitoxin to the poisons in the blood.

Phlegmon, furunculosis, and various forms of dermatitis and eczema are very prone to occur in gouty, rheumatic, and diabetic subjects, and require the dietary appropriate to the underlying pathological condition. An excess of sugar more especially in the tissues renders them good culture media for the pus organisms; and the same is true of urea. Intestinal fermentation may be an essential factor in eczema; in the common infantile varieties more especially it is a matter of general experience that all our remedies are of but transient effect until we succeed in regulating the feeding and putting the gastrointestinal tract in a healthy condition.

As a general rule for all the dermatoses, the patient should be made to restrict the diet carefully to the foods that agree perfectly, and take small meals at regular and not too frequent intervals. A single hasty meal taken when overfatigued, overheated, or irritated may affect him injuriously enough to determine the recrudescence of a disappearing eruption and change his condition for the worse.

**Eczema Metastasis.**—Though fully aware of its inaccuracy, I employ this term to designate certain supposed systemic ill effects caused by the cure of an eczematous or other dermatosis. We have regarded the old idea of the dangers of these diseases "striking in," as it was called, as entirely antiquated in the profession, though it still retains its hold on a considerable section of the laity. Yet Feer<sup>1</sup> reports 8 cases from the Basle Children's Hospital in which death occurred after the cure of an eczema; and he has found 22 similar cases in the literature. In a number of them there was enlargement of the thymus, but no other trouble of any kind. Some died of pleurisy and bronchopneumonia; in others there was no demonstrable cause of death. Butte<sup>2</sup> thinks that there may be something in the old idea, and cites 2 fatal cases of his own. He holds that eczema is caused by internal toxins excreted by the skin; and he believes it possible that in certain cases the sudden and complete stoppage of this elimination may have deleterious effects. De Amato<sup>3</sup> also believes in eczema metastasis, especially in children and the aged; he holds that there is a reciprocal relationship between the eczema and the bronchopneumonia, asthma, gout, rheumatism, etc., in these cases. His idea is similar to that of Butte; the dermatosis is a skin reaction to toxin elimination; and he goes to the extent of warning us against too vigorous treatment, especially in the eczema capitis

<sup>1</sup> Correspondenzblatt f. Schweizer Aerzte, xxxiii., No. 24; Journal of the American Medical Association, April 16, 1904.

<sup>2</sup> Annales de therapeutique dermatologique et syphiligraphique, vol. iv. No. 7.

<sup>3</sup> Monatshefte f. praktische Dermatologie, March 1, 1904.

of infants. He lays stress on the diet for both the mother and the child in these cases, and only treats the eczema locally when the other conditions have been set entirely right.

It is interesting to see an old and abandoned theory crop up rehabilitated like this; but I am afraid that we must regard these observers as mistaken in the conclusions that they draw from the cases that they record. With two such common affections as eczema and bronchopneumonia, of each of which there must be hundreds of thousands of cases in the civilized world every year, there will necessarily be some cases of their coincident or consecutive appearance. The same holds true of the other affections. Nor is it strange that a few cases of death without demonstrable cause after the cure of an eczema have been observed. The same thing happens without precedent eczema, as those of us who have had occasion to see much postmortem work are well aware.

On the other hand, innumerable cases of eczema of all varieties and at all ages have been and are being cured, not only without deleterious effects, but with demonstrable benefit of every kind. Jadassohn only voices the general opinion when he states, apropos to Feer's article, that he has never seen an eczema death. The subject would hardly be worthy of consideration in these pages had it not been seriously dealt with by these authorities. There is some little danger also that medical opinions of this kind may gradually reach the laity, and intensify the strength of erroneous notions that to some extent interfere even to-day with the proper treatment of these cases.

**Facial Cosmetics.**—We are not infrequently consulted by women as to the general measures to be taken for the care of the skin and the preservation of its health and good appearance, as well as for the relief of slight abnormalities and defects. It is a mistake, I think, to dismiss the subject as unimportant and unworthy of consideration, since even trivial defects of the complexion are sources of much anxiety and mental trouble to sensitive females.

The prejudice against the use of soap and water on the face confronts us continually, and must be as continually combated. Of course, there are skins on which ordinary soap and water has an irritant effect; but this is almost always due to the employment of improper materials for the purpose. The face is exposed more than any other part of the body except the hands to the noxious influences of the atmosphere dust, dirt, etc.; it is abundantly supplied with large sebaceous glands; and it will be benefited and not harmed by a thorough cleansing once a day done in the proper manner. But the water must not be hard, since it then tends to make the skin rough and coarse. Hard water should be boiled before using, or a small amount of soda or potash

added to soften it. A pure neutral soap is the best to use, since an excess of alkali renders soap irritant. Strongly alkaline soaps or green soap, pure or in the form of the tincture, are only to be employed when there is a marked excess of oily secretion on the face. When the tendency is to a seborrhœa of the dry, scaly variety, and the skin is rough, thickened, and harsh, finely powdered pumic stone, or a soap containing marble dust or sand will render good service.

When the stronger alkaline soaps are used, and in all cases in which the skin becomes dry and harsh after the washing, I am in the habit of ordering the inunction of a very small amount of pure almond oil with a few drops of oil of rose after the face has been washed and dried. It is well not to deprive the superficial epidermis too entirely of its fat. Carefully inuncted and well rubbed off, this can be done without making the face look greasy; and there is no objection to the subsequent employment of a suitable face powder in small amount, which will then adhere properly to the skin.

As regards face powders, the only one that I recommend is very finely powdered starch. The scented commercial preparations are very liable to contain mineral and other matters that have an injurious effect upon the skin.

The ordinary toilet waters are, as a rule, to be avoided entirely. They often contain an excess of alcohol or other ingredients that are liable to be harmful. If one must be employed I write for the following: Boric acid, 1; rose-water and Cologne spirit,  $\text{ââ}$  5; distilled water, to 100 parts. This will do no harm. I prefer, however, to direct the patient to add from a half to one teaspoonful of the compound tincture of benzoin to a basin of warm water, and have her sponge her face with this. This forms an excellent bleacher and complexion improver.

Occasionally, though rarely more than is commonly supposed, we meet with cases in which even the mildest soaps seem to irritate. Here a superfatted soap is in place; the following is a good formula: Beef-tallow, 39.3; olive oil, 7.4; potash lye ( $28^{\circ}$  Baumé), 11.1 parts.

Jackson considers the subject of facial cosmetics in a recent article,<sup>1</sup> but devotes his attention more especially to lesions that are perhaps better considered under the heading of the various diseases. *Warts* of the ordinary variety are to be curetted, and their bases touched with pure carbolic or glacial acetic acid, or covered with a concentrated salicylic acid collodion. This process is to be repeated as often as is necessary. I prefer to use Unna's "microbrenner" modification of the Paquelin, or, better, the microcautery I devised some years ago<sup>2</sup> for the destruction of the hypertrophied papillæ. Senile warts Jackson recom-

<sup>1</sup> Monatshefte f. praktische Dermatologie, May 1, 1904.

<sup>2</sup> Journal of Cutaneous and Genitourinary Diseases, October, 1899.

mends us to leave alone; if something must be done a strong salicylic acid collodion can be applied. Growths of this kind that show a tendency to increase in size are to be regarded and treated as epitheliomata; in this I quite agree with the author. I have repeatedly advocated the employment of the caustic treatment in this class of cases.

For nævi Jackson uses liquid air, no matter whether the lesions are pigmentary, vascular, or hairy. I have had no personal experience with this agent, since even in New York it is difficult to obtain and keep on hand. Its use is certainly out of the question in general practice. The electrolytic needle and the microgalvanic or Paquelin cautery are quite sufficient in the class of small growths under consideration.

Lentigo, or freckles, is an unsatisfactory condition to treat, since it is so prone to return after removal. A strong peroxide of hydrogen solution used persistently will bleach them; or the epidermis with the pigment accumulations can be removed by the use of one of the peeling pastes recommended for acne. In bad cases I am in the habit of prescribing a peeling paste as follows: Betanaphthol, 1; sulphur præcip., 3; green soap and vaselin,  $\text{â}\text{â}$  2 parts. This is left on the face for a time varying between six and forty-eight hours, depending on the dermal reaction. I direct the patients to apply it early in the day; if by nightfall there is marked burning and reddening of the skin, it is removed with oil and cotton, and a mild dusting powder applied. If there is no reaction by nightfall, the paste is left on until morning. Next day the process is repeated until a good dermal inflammation is obtained. Then the dusting powder, or, if there is very much reaction, boric acid or zinc ointment is used. The skin peels in large, thick flakes, bringing the superficial pigment with it. For the prevention of a renewed appearance of the freckles as far as possible a dark veil should be worn when exposed to the sun, or the face may be painted with the following: Calomel, 1.3; zinc oxide, 4; glycerin, 8; aq. calcis, 24; aq. rosæ, 12 parts.

Superfluous hair is best removed by electrolysis; but great skill and practice is required to get permanent results without scarring. Repeated cautious depilation with the  $x$ -ray is said to finally yield permanent results; and cases have been reported in which patients have been satisfied to undergo radiotherapeutic epilation two or three times a year, which has sufficed to keep their faces clear of hair.

**Gangræna Otitis Multiplex.**—Under this heading we group a number of cases in which, from causes as yet obscure, gangrene occurs in localized and usually multiple areas of the skin. We exclude from the category the local necroses caused by chemical, thermic, or mechanical influences, as well as those that accompany diabetes, Raynaud's disease, hysteria, etc. Reddish spots or urticaria-like infiltrations appear spontaneously, and without sensory disturbance; with or without the appearance of



vesicles or bullæ and within a few hours they change into dry, depressed, yellowish or brownish-black areas of necrosed and firmly adherent skin. These are slowly cast off by reactive inflammation. As a rule, the affection is a chronic one, lasting for months or years with continuous involvement of fresh areas of skin; but in a number of cases of multiple cutaneous gangrene other affections have been concomitant or supervening, and a fatal termination has ensued. Such was the case with the patient here pictured (Fig. 14), who entered the hospital suffering from delirium tremens, so that no proper history of the dermal affection could be gotten, and soon developed a pneumonia that carried him off.

There were numerous areas of necrotic skin on the limbs and various other parts of the body; and in some places it looked as if a local hemor-

FIG. 14



Gangræna cutis multiplex. (Gottheil's case.)

rhage had preceded the gangrene, and the process had commenced as a purpura of malignant form.

Several cases of the affection have been reported during the past year or two. Bronson<sup>1</sup> had a case in which the anterior surface of the tibia was affected; an unusual site. Duhring regarded it an erythema gangrænosum rather than an example of true multiple neurotic gangrene. Latte<sup>2</sup> reports 3 cases of multiple cutaneous gangrene; but they all 3 occurred in hysterical women, and were possibly self-inflicted. Brandweiner<sup>3</sup> notes a case of four years' standing, in which the lesions looked at first like those of zoster, though each one ended in superficial gangrene. There is, of course, a gangrenous zoster, mild forms of which are not

<sup>1</sup> Journal of Cutaneous Diseases, October, 1903.

<sup>2</sup> Journal of American Medical Association, November 12, 1904.

<sup>3</sup> Ibid.

very uncommon, and in last year's issue of *PROGRESSIVE MEDICINE* I noted and figured two personal cases of traumatic gangrene of the skin.<sup>1</sup> There is, however, a real idiopathic multiple gangrene of the skin, though it is of very rare occurrence.

**Lupus Vulgaris.** TREATMENT.—After all these years of work upon it this subject still remains under discussion; proof that we are far from having definitely fixed ideas concerning it. Hoy<sup>2</sup> has lately used turpentine locally in several cases, employing picric acid gauze or cotton to keep the application in place. He reports rapid and satisfactory healing of the ulcerations, and no relapses. Let us hope that this is not merely another of the numerous measures that seem to be successful chiefly in the hands of their originators.

FIG. 15



Lupus vulgaris. (Gottheil's case.)

The method of election, of course, is the Finsen treatment (see Actinotherapy). It is, however, beyond the reach of American practitioners at present, and we must have recourse to other measures.

Dreuw<sup>3</sup> announces that he has devised a simple, inexpensive technique which has proved effectually curative, and can be applied by any practitioner. It consists in first freezing the part with ethyl chloride, a treatment that he has long advocated, and then rubbing in crude hydrochloric acid saturated with free chlorine. The acid causes an immediate and very extensive leukocytic emigration. Even old lupus cases yield to this treatment; and in three patients treated over a year ago there has been no tendency to relapse. For tuberculous abscesses and fistulæ

<sup>1</sup> *PROGRESSIVE MEDICINE*, September, 1904, p. 116.

<sup>2</sup> *Therapeutic Gazette*, May 15, 1904.

<sup>3</sup> *Berliner klin. Wochenschrift*, 1904, No. 47.

Dreuw recommends the same treatment under narcosis; and he advises, though he has not tried it, its combination with phototherapy. I am afraid that it is entirely too severe, especially for employment about the face, which is the region most commonly affected. To first freeze a patient's nose and then to rub in crude hydrochloric acid would be liable, I am afraid, to cause a very undesirable amount of reactive inflammation, and possibly even sloughing. It would certainly cause much scarring; and if we are willing to have that there are many other more manageable caustics and cauterants that we can employ.

FIG. 16



Lupus vulgaris. (Gottheil's case.)

At the International Congress of Dermatology held at Berlin in the fall of last year Morris<sup>1</sup> reported this subject exhaustively. His consideration of all the treatments recommended for lupus vulgaris during the last twenty-five years led him to the following conclusions:

1. Chemical caustics can only be considered as good adjuvants to phototherapy. Pure pyrogalllic and pure salicylic acid must be placed in the same category. Of the commoner caustics, the acid nitrate of mercury leaves especially undesirable scars; the other acid or alkaline caustics are preferable.

<sup>1</sup> Lancet, October 22, 1904.

2. The galvanocautery is one of our best measures when phototherapy and radiotherapy are inapplicable. It can be precisely applied, and the pain that it occasions is very transitory.

3. Scarification is of diminished importance since Finsen's discovery, and is less used.

4. Curetting is rapid and sometimes useful. It must be followed by energetic cauterization with pyrogallic acid or chloride of zinc or fuming nitric acid. The last agent is especially good for small nodules. Thorough employment of this method requires general anæsthesia; it leaves bad scars.

5. Excision can be employed on the trunk and limbs, when the disease is not too extensive.

6. Phototherapy (actinotherapy) is the most satisfactory of all the methods of treatment, but it is not more infallible than the others. The cicatrices are good. It has practical disadvantages, however, which limit its employment.

7. Radiotherapy (*x*-ray) is better than the Finsen treatment for ulcerated surfaces and for the mucosæ. It is more rapid than actinotherapy.

8. Tuberculin does not cure these cases, but Morris thinks that it helps the other remedies.

Morris ends his article as follows:

(a) In spite of the improvements in treatment during the last twenty-five years, relapses are still the rule.

(b) We cannot promise a cure save in the case of small chronic, torpid patches.

(c) In extensive lupus of the face the Finsen treatment and the *x*-ray are to be employed; they must be used for very long periods of time.

(d) Thermic and chemical caustics can be used to hasten results.

(e) General tonic treatment is required in extensive cases.

(f) Many cases are still incurable, though there are less of them than formerly.

I think Morris' conclusions in the main represent the best dermatological opinion on the subject. The only exception I would make is as to the value of tuberculin. I am inclined to think that it has none at all in tuberculosis of the skin.

**Nævus, Vascular and Pigmented.**—While moles of the pigmented and hairy varieties in the newborn and in infants may be left alone for cosmetic treatment, if required, in later life it is different with the chiefly or entirely vascular varieties. These are liable to extend quite rapidly, being in some cases apparently angiosarcomatous in structure rather than simple vascular overgrowths. They should be watched carefully, and active interference should be instituted as soon as we are positive that they are increasing in size. There is no objection to com-

mening treatment very early; I have begun with a number of them at the fourth to the sixth week of life.

In previous reviews<sup>1</sup> I have referred to various methods of treatment, more especially the electrolytic, advocated by Rockwell and others. Griffiths<sup>2</sup> has successfully employed Wyeth's hot-water method in a half-dollar sized nævus of the scalp and a venous nævus of the tip of the nose. He injected about a drachm of sterilized water at a temperature of from 180° to 200° without anæsthesia. The nævus becomes tense, blanched, and cystic after the treatment. Three days later the growth was mottled white and the swelling was gone. Other injections were necessary at intervals of a few days, but the amounts of fluid employed in the later ones were much less. It is important to have the fluid as near the boiling point as possible, to secure prompt and firm coagulation and to prevent the occurrence of embolism. I have had no personal experience with this method. There is necessarily some difficulty in the technique in handling an injection fluid so near the boiling point, and I have heard of more than one case in which extensive sloughing occurred in consequence of the injections. This is a matter of extreme importance when the nævus, as is often the case, is situated upon the face. The growths are disfiguring, and possibly dangerous; but we will hardly be thanked for relieving our patients from them at the expense of a long and tedious necrotic process, and with a permanently deforming result. I would reserve the injections for cases not amenable to other treatment only; and I should make exactly the same criticism of the pure alcohol injections that have been advocated for these growths.

Frattini<sup>3</sup> and others again advocate the treatment first advised by Monteggia in 1857, and revived by Piorani in 1882 and later again by Unna, of painting the nævi with corrosive sublimate in flexible collodion. He uses a 6 per cent. solution and applies it every third day until the slough separates. Then an antiseptic dressing is applied. Frattini claims to have had 30 successful cases. I can only say that I have tried it in a number of cases, with varying strengths of sublimate, and without any result at all. Some slight local inflammatory reaction occurred with the stronger applications, and there was a little crusting; but the action of the application was entirely superficial, and there was absolutely no effect on the redundant vessels themselves. Unna has laid stress on the employment of non-flexible collodion as the base, claiming that the constricting effect was of importance. I have tried this also, without any better results.

The Roentgen treatment has been a good deal advocated in this as

<sup>1</sup> PROGRESSIVE MEDICINE, September, 1902, p. 184; September, 1903, p. 151.

<sup>2</sup> New York Medical Journal, May 2, 1903.

<sup>3</sup> Gazzeta degli Ospedalia; Medical Review of Reviews, November 25, 1903.

in other intractable dermal lesions. Levack<sup>1</sup> has cured 3 cases of *nævus flammeus* of the face and body, but at the expense of prolonged ulceration and permanent scarring. But if a destructive inflammation is required we have far better, surer, and safer agents for effecting it than the *x-ray*. The chemical caustics, nitric and trichloroacetic acid, and more especially the galvanocautery, are quicker of action, more certainly limited, and just as efficacious.

As regards the use of the *x-ray* in general in the treatment of *nævus* the reports are not very satisfactory. Allen<sup>2</sup> has had decided improvement in one case, but he supplemented the treatment with that by the electrolytic needle and the actinic ray lamp. The other reports, such as those of Dickson and of Taylor, are the usual ones of "improvement;" Jutassy records "paling;" but no one of authority definitely records cures of vascular *nævi* by this means. In the hairy varieties, of course, depilation can be effected by radiotherapy; and possibly some effect in the way of endarteritic inflammation and thrombosis can be obtained. But the Roentgen treatment cannot be regarded as satisfactory for *nævi* in general.

A similar criticism holds good of the actinotherapeutic method after Finsen. Heidingsfeld and Allen report "some success;" but the latter author here again uses electrolysis as well, and I believe that what good results he has had are to be attributed chiefly to this latter. The use of radium in these as in other conditions is of entirely problematic efficacy at this present writing. What little I have heard and seen of its so-called effects do not dispose me to regard it with favor. The high-frequency current applied by means of a small-pointed carbon electrode is effective in the smaller vascular *nævi*; but its action is that of a cauterant and I do not think that it presents any advantages over the galvanocautery described above.

There remains to be mentioned the treatment with the application of strong solutions of hydrogen dioxide. Cohn<sup>3</sup> used a 30 per cent. solution, applying a single drop twice a day with a glass rod, and allowing it to dry *in situ*. He claims to have gotten good results even in extensive cases. It is only recently that solutions of this strength have been obtainable. I have used the 25 per cent. peroxide in 3 cases, but have not been impressed with the results. It causes blanching of the tissues, and the lesion appears to be improved; but when treatment is stopped the condition remains about the same.

As a matter of fact there is no better treatment for smaller *nævi*, and even for large ones if they are treated in sections, than the cautery,

<sup>1</sup> Medical Standard, April, 1903.

<sup>2</sup> Radiotherapy and Phototherapy. Philadelphia, 1904.

<sup>3</sup> Journal of the American Medical Association, January 9, 1904.

provided a suitable instrument is employed. The ordinary Paquelin is entirely too large and clumsy for delicate work, such as is required around the face; and the left hand is needed to compress the bulb. The galvanocautery handles and knives are suited for larger work only, and the heavy and stiff conducting cords interfere still more with delicate manipulation. Unna devised a microcautery of the Paquelin type some years ago; but the instrument has not found any extended acceptance, largely, I think, on account of the rapid deterioration of the copper caps under usage.

I had a cautery made for me by the Wappler Electric Controller Company in 1899 (Fig. 17), which I have used continuously since that time and which I have found entirely suitable for the work.<sup>1</sup> The cautery handle is of hard rubber, four inches long, and shaped like a carpenter's lead-pencil. It can be held like a pen, with the little finger and the edge of the hand resting on the adjacent tissue; the current is controlled by a button immediately under the index finger, and flows

FIG. 17



Gottheil's microcautery.

only when contact is made by depression. The spring is light, and contact is instantly made and broken; and this, in combination with the extreme lightness and handiness of the instrument, permits the manipulation of the cautery with the utmost rapidity and delicacy. The contacts under the button are a fruitful source of trouble in instruments of this kind. A minute arc is formed as the current is made and broken; corrosion occurs, no matter what metal is employed, and the oxides formed are non-conductors and interfere with the flow of the current. The contacts here are made of platinum, as the most resistant metal; and they are so arranged that they may be rubbed against one another by lateral motion of the button, and thus freed of the oxides adherent to them.

Posteriorly the handle terminates in two slightly diverging binding posts for the cords; in front are two short arms coming close together, and terminating in small bulbous ends containing the orifices for the points and the small watchmaker's screws by which these latter are held

<sup>1</sup> *Journal of Cutaneous and Genitourinary Diseases*, February 1899.

in place. The cautery points themselves are made of iridoplatinum wire, and are fashioned as required. From No. 22 to No. 30 wire can be used, so that all shapes of points can readily be made. The wire is heated, and is then bent with a small pair of plyers or beaten with a small hammer into the required shape.

The cords are much thinner and lighter than is needed for the heavier cauteries, and they are very flexible, so that they do not in any way interfere with the free manipulation of the instrument. For source of power I employ the street current with a motor generator and transformer. Several forms of such apparatus, and of moderate price, are now on the market. It is the most convenient source and has never once given me any trouble during the ten years or more that I have been employing it. But storage batteries or any other device for heating the knives may be used where the street current is not available. Only from 2 to 4 volts are required. The knives made of the lighter wires, from No. 26 on, will run on one storage cell; the lower heavier wires require two.

Reviewing the entire subject of the treatment of these abnormalities I can formulate the following conclusions:

1. The Roentgen treatment is effective in the hairy varieties of *nævus* for depilatory purposes; it can be tried in the other and in the mixed forms, but must not be pushed to the extent of causing ulceration. High-frequency currents, the actinic light, and radium are not as yet of proven efficacy.

2. Local treatment with sublimate collodion has not been successful; nor have I had any satisfaction from the use of the strong peroxide solutions.

3. Hot-water injections are to be used only in cases that are not amenable to other treatment. The possibility of undesirable effects must be kept in mind, and they should not be used on the face.

4. Electrolysis, as previously described,<sup>1</sup> and the chemical and actual cauteries are still our most reliable remedies for this class of deformities. The first is the treatment of election, more especially for lesions upon the face.

**Nail Affections.**—Perhaps the most unsatisfactory field in the entire range of dermatology is that of the disease of the nails. Even its symptomatology is ill-defined, so that differences of opinion as to the nature of the affection in any given case are very common, and in many instances it seems impossible to make a definite diagnosis, and treatment is entirely empirical and very unsatisfactory. Among the commoner nail affections are the various forms of atrophy, the parasitic affections, ringworm and

<sup>1</sup> PROGRESSIVE MEDICINE, September, 1902, p. 173.



favus, eczema and psoriasis, syphilis, dermatitis exfoliativa, lepra, onychogryphosis and other hypertrophies, together with the onychias and paronychias due to pyogenic infection of the nail-bed and the peringual tissues. There is but one fairly exhaustive book on the subject that I know of, and that was published by Heller in 1900; it has not yet been translated, so as to render it accessible to English readers.

The diagnosis of these affections is often a matter of great difficulty, except when they occur in conjunction with lesions of the general integument. When the nails alone are involved it is not infrequently impossible to make a satisfactory diagnosis. Several articles upon the subject have appeared during the last year or two. That of Bering,<sup>1</sup> however, deals only with a case of koilonychia or spoon-shaped deformity of the nails, together with two cases of subungual papilloma and hyperkeratosis of the nail-bed, respectively. Levisseur<sup>2</sup> also confines himself chiefly to those affections that he has seen; and he claims that in general it is only the presence of characteristic lesions upon other portions of the body that render a positive diagnosis possible. Ringworm of the nails, however, is not so very uncommonly the primary form of the affection, and it is important to recognize its appearance. It begins with a yellowish discoloration of the nail-bed, with hyperkeratosis of that structure, and a loss of the natural glossiness of the superficies of the nail. Usually the upper layers of the nail become brittle and are broken off, and the unguis surface is covered with the rough, inelastic, dirty-brown remains of the nail structure; a condition in which the diagnosis is difficult, but the trichophyton can be readily recognized by microscopic examination. The affection is oftenest seen in elderly people, though whether this is on account of predisposition to infection from senile changes in the nail-bed or because of proneness to fondle dogs and cats, the common sources of the infection, the author cannot say.

Favus of the nails is in general much commoner than ringworm, but almost always occurs in cases where the head is affected. It begins at the free edge of the nail with the appearance of small lacunæ in the nail substance. Both in this affection and in ringworm Levisseur advises avulsion of the nail followed by sublimate compresses. The application of the tincture of iodine is efficacious only in the very mildest cases. Caustics, and the sharp curette are not to be used, since the slightest injury to the matrix causes permanent deformity of the nail.

Eczema of the nails is difficult to differentiate from the other affections of that organ. Deep ulcerations occur from the action of the arsenic

<sup>1</sup> Münchener medicinische Wochenschrift; Monatshefte f. praktische Dermatologie, June 15, 1904.

<sup>2</sup> Transactions of the American Dermatological Association; Monatshefte f. praktische Dermatologie, June 13, 1904.

in Paris-green workers; they are especially liable to appear in the region of the lunula as dry, black, mummified lesions, and are usually painless. Seal-skin dyers are very liable to have flat, wart-like excrescences around the nails, with a subungual hyperkeratosis; the exact cause is as yet undecided; pyrogallol, aniline black, or peroxide of hydrogen, all of which are employed by these workmen, may any one of them be the noxious agent.

For koilonychia or spoon-shaped deformity of the nails, Ohmann-Dumesnil<sup>1</sup> recommends the following: Oleate of tin, 3.75; lanolin, ung. aq. rosæ, āā 15; to be thoroughly rubbed in twice daily. Arsenic should be pushed internally, preferably in the form of the Asiatic pill.

Two cases of pityriasis versicolor of the nails are reported by Campana<sup>2</sup> from the Dermatosyphilitic Clinic of the University of Rome. One of them had general pityriasis of the body. The nails were brittle, but were not hypertrophied, and the characteristic parasite was found in the scales.

There are some nail diseases, however, which it is impossible to classify among the recognized affections, and in which no other structures are involved. This is notably the case with the disease that Heller calls onychorrhaxis, a variety of atrophy. The nails become longitudinally fissured, very brittle so that they are constantly being chipped off by ordinary usage, and very tender.

**Noma.**—In the review of 1902<sup>3</sup> attention was called to the fact that a number of observers had found the diphtheria bacillus, usually in conjunction with streptococci, staphylococci, and other organisms, in typical cases of this disease. Blumer and MacFarlane, on the other hand, considered a thread-like leptothrix that they cultivated the active agent. The later investigations of Sailer and Korsch support the former view; while Trambusti and von Ranke have found still other organisms.

Trambusti<sup>4</sup> has published some further investigations on the subject. In seven new cases he found various organisms. Three times he isolated the micro-organism that he has described before; once he found a pseudodiphtheria bacillus; he always found the yellow and almost always the white pus organism; and in some cases the proteus vulgaris (a non-pathogenic blastomycelium), the yellow sarcina, and others. He now holds that there is no specific organism responsible for the affection, but that the streptococcus is the most important and the most commonly present. Durante<sup>5</sup> agrees with this; he also failed to find any constantly present organism.

<sup>1</sup> Monatshefte f. praktische Dermatologie, April 13, 1904.

<sup>2</sup> Ibid., March 1, 1904.    <sup>3</sup> PROGRESSIVE MEDICINE, September, 1902, p. 186.

<sup>4</sup> Il Policlinico; Monatshefte f. praktische Dermatologie, May 1, 1903.

<sup>5</sup> Riforma Medica, vol. iii., No. 2.

I append a picture of a case that occurred in the Lebanon Hospital service of Dr. A. Mayer, of this city (Fig. 18). It occurred in a colored child that was brought to the hospital in a practically moribund condition, and lived only two days thereafter. There was no history obtainable save that the child had been treated for an ulcerated tooth for some time previously.

Motschan<sup>1</sup> describes an almost exactly similar case occurring in a boy, aged nine years, in the course of a pneumonia. The treatment consisted in the constant subjection of the affected areas to the light of a 16-candle-power red, incandescent electric lamp, without any other local treatment at all. Pain and odor soon disappeared; the necrotic tissue was cast off, and recovery ensued. Motschan calls attention to

FIG. 18



Noma. (Mayer's case.)

the fact that Sokolow in 1900 described a case that was cured by similar treatment. He believes that the red light, while entirely devoid of any direct bactericidal action, gives the tissues increased powers of resistance in some unknown way.

**Pemphigus.**—With the increase of emigration from Eastern and Southern Europe to this country the severer general dermatoses are undoubtedly seen with greater frequency; and of these pemphigus in its various forms is one. Twenty years ago the disease was very rare; now I see several cases every year, usually in Italians or Russians, and there are always some cases in my City Hospital and Lebanon services.

A number of articles on the subject have appeared during the last year or two. Hoffmann<sup>2</sup> could find no specific microbe in the serum and pus from his case. He summed up his experience of the subject

<sup>1</sup> Berliner klinisch-therapeutische Wochenschrift, 1904, Nos. 21 and 22.

<sup>2</sup> Dermatologisches Centralblatt, July, 1903.

in the statements that the best possible hygiene and tonics were our only means of treatment, and that in spite of it the usual termination was death in from three to seven months. Moos<sup>1</sup> records a case in a child, aged two and one-half years, that ended in recovery under an astringent powder. Hein<sup>2</sup> cured 2 cases with the blue arc light after all other treatment had proved useless; he thinks this method should be looked into.

Two good papers are those of Van Harlingen on "Hysterical Neuroses of the Skin," many of which are pemphigoid in form, and C. J. White on "Recurrent Progressive Bullous Dermatitis;"<sup>3</sup> but in these cases the element of malingering is such an ever-present and misleading factor that they are of but little value in clarifying our ideas of the disease. Frick<sup>4</sup> records a case of two years' standing in which the staphylococcus pyogenes aureus and another typhoid-like organism were found. Secchi<sup>5</sup> also found the staphylococcus aureus in the fluid of the bullæ; he regards the affection as a pure staphylococcus septicæmia. Balser and Fouquet's case<sup>6</sup> was of the hysterical variety. Unna<sup>7</sup> discusses the subject with customary thoroughness; and Fabry<sup>8</sup> describes a case of pemphigus foliaceus, without, however, adding anything especially new to the subject. Eustis<sup>9</sup> has made a series of animal and culture experiments with a case and thinks he has found a characteristic and peculiar diplococcus. This organism is found in the bullous fluid; it causes death in rabbits when injected intravenously; and cultures of a similar diplococcus from the blood of these rabbits caused a pustular eruption, with mild constitutional symptoms, when injected into the veins of a pig. I think that it is safest at present to regard pemphigus as the expression of a general toxæmia caused by the pus organism, without attempting to decide on the exact microbic agent involved.

**PEMPHIGUS OF THE MUCOUS MEMBRANES.**—This is a rare condition, but when it does occur its recognition is a matter of great importance. This was brought home to me very forcibly by a case on my service at Lebanon Hospital last year, and which will be published in detail elsewhere. The patient was sent to me with a diagnosis of syphilis;

<sup>1</sup> Münchener medicinische Wochenschrift; Monatshefte f. praktische Dermatologie, May 1, 1903.

<sup>2</sup> Die medicinische Wochen.; Monatshefte f. praktische Dermatologie, May 1, 1903.

<sup>3</sup> Journal of Cutaneous Diseases, September, 1903.

<sup>4</sup> Journal of the American Medical Association, May 30, 1903.

<sup>5</sup> Riforma Medica; Journal of the American Medical Association, May 30, 1903.

<sup>6</sup> Bulletin de la Société médicale des hôpitaux de Paris; Annales de dermatologie et de syphiligraphie, December, 1903.

<sup>7</sup> Die Therapie der Gegenwart; Archiv f. Dermatologie und Syphilis, July, 1903.

<sup>8</sup> Archiv f. Dermatologie und Syphilis, June, 1904.

<sup>9</sup> American Medicine, April 16, 1904.

the buccal affection was supposed to be due to the presence of mucous patches. My diagnosis was mercurial stomatitis, and I only gave it up when persistent and long-continued treatment had no effect on the condition. There was a violent stomatitis, of course, and from time to time there appeared peculiar eroded patches on the gums, lips, and tongue. Finally, Dr. W. Cowan, whom I asked to see the case, suggested the possibility of its being a beginning pemphigus. And such it proved to be. The mouth affection was entirely intractable, but it was nearly a year before other bullous lesions began to appear around the finger and toe-nails. Several months after that she developed pemphigus of the body, and ultimately died of sepsis.

In the absence of lesions of the general integument the diagnosis will always be difficult, for neither vesicles nor bullæ appear on the mucosæ, and a very superficial denudation of the epithelium in areas, very similar to that seen in a violent stomatitis of other origin, is the only special symptom. Yet this possibility should be borne in mind when we encounter a very obstinate stomatitis for which there is no ascertainable cause.

Wechselmann,<sup>1</sup> indeed, claims the pemphigus vegetans usually begins in the mouth; and Rosenthal<sup>2</sup> holds that this is the case with the ordinary varieties of the disease also, but it is not recognized, and the dermatologists only see the patients when the malady has involved the general integument. Barlay<sup>3</sup> records a case of pemphigus of the conjunctiva. This is a very rare affection; he only found two cases in 145,927 eye cases seen during twenty-eight years. The other mucosæ, and especially that of the mouth, are usually simultaneously affected. Monfort<sup>4</sup> holds that the mucous membranes are usually affected with the skin, or after it; but records the fact that Mesnard and Dickson have seen it precede the skin eruption by several days. He claims that it is a rather common disease; he sees at least two cases annually, and that the prognosis is good. A case of pemphigus of the œsophagus is noted by Roman-Tameil.<sup>5</sup>

In pemphigus of the general integument there are certainly, from a prognostic point of view, benign and malignant cases; and it may be the same with the affection of the mucosæ. But all the cases that I have seen in which the mucous membranes have been affected have ended fatally, and I should not give any but a very bad prognosis in any such case, either primary or secondary.

<sup>1</sup> Dermatologisches Centralblatt, July, 1903.

<sup>2</sup> Ibid.

<sup>3</sup> Orvosi-Hetilap; Monatshefte f. praktische Dermatologie, May 1, 1903.

<sup>4</sup> Revue hebdomadaire de laryngologie, d'otologie, et de rhinologie; Archiv f. Dermatologie und Syphilis, October, 1904.

<sup>5</sup> Monatshefte f. praktische Dermatologie, February 1, 1905.

**Pruritus.**—To judge by the space that it occupies in the general medical journals, and the number of infallible prescriptions for its relief that appear each year, pruritus is the dermal symptom about which the practitioner is most frequently consulted, and which he most often fails to relieve. In the absence of any very troublesome or disfiguring dermatosis it is certainly the symptom upon which the more ignorant of our patients lay the very greatest stress; they refuse to consider themselves cured, even if all objective signs of disease have disappeared, so long as the least itching remains.

Now the fact of the matter is that with many of the pruriginous dermatoses itching persists for a long time after the disease is cured, and disappears but slowly and gradually. Habit seems to play a large part in this persistence. Bottstein<sup>1</sup> calls attention to the role of tobacco as a causative factor in many of the cases of localized and general pruritus, and as an agent that prolongs the neurosis in many of the itching affections. The French practitioners recognize this fact, and always forbid smoking where the symptom is present. Bottstein records 3 cases, 1 of general pruritus and 2 in which the scrotum and anus and the eyebrows respectively were affected, which disappeared when smoking was stopped and promptly reappeared when it was begun again.

A number of more or less elaborate articles on the subject have appeared during the year. Dickinson<sup>2</sup> very properly lays stress on the importance of treating any general disease, such as anæmia, chlorosis, diabetes, Bright's, etc., that may be present. Tuttle<sup>3</sup> and Hartzell<sup>4</sup> also emphasize this point; the latter tabulates the following internal remedies in the order of their usefulness: Bromides, cannabis indica, fluid extract of jaborandi (13 to 20 drops t. d.), antifebrin, antipyrin, phenacetin, and salol. Bosse<sup>5</sup> claims to have cured a case of pruritus senilis with injections of Pohl's sperminum. Menage<sup>6</sup> believes that he has gotten the best results from cannabis indica, beginning with 3-drop doses well diluted and gradually increasing the amount. Besides this he approves of camphor monobromate, valerian, musk, and castoreum, separately or combined, in pill form and in full doses.

Chief stress, however, is laid on the local treatment by all these authors. Tuttle (*l. c.*), referring more especially to pruritus ani, recommends the following as the two best local applications: Ac. carbolic., 7.3; ac. salicylic., 3.73; glycerin, 30, and fluid extract of hamemalis, 30; fluid extract of ergot, 60; fluid extract of hydrastis, 30; tinct. benzoin comp.,

<sup>1</sup> Medical Review of Reviews, December 3, 1904.

<sup>2</sup> Detroit Medical Journal, July, 1904.

<sup>3</sup> Monatshefte f. praktische Dermatologie, August 1, 1904.

<sup>4</sup> Ibid., July 13, 1904.

<sup>5</sup> St. Petersburger medicinische Wochenschrift, 1904, No. 7.

<sup>6</sup> New Orleans Medical and Surgical Journal, November, 1904.

7.3; carbolized oil (3 per cent.), 30. He uses chloral (0.6 to 30) when rhagades are present. He also recommends argyrol, 30 per cent., used at first daily and then every second or third day; between times the following ointment is to be employed: Ac. carbolic., 0.2; resorcin, 0.3; ichthyol, 1, and vaselin, 10. Hartzell (*l. c.*) prefers thymol for pruritus senilis, and after that resorcin  $\frac{1}{2}$  per cent. or more in sodium chloride solution. Gaucher recommends<sup>1</sup> the following ointment very highly: Hydrogen superperoxid. puriss., lanolinum anhydric., vaselin, talc. pulv., aa 20. Reichmann<sup>2</sup> lauds epicarin in 10 to 15 per cent. salve or solution as an antipruritic. Menage (*l. c.*), in addition to the usual antipruritics carbolic acid, camphor menthol, and chloral, applies galvanism as strong as it can be borne when the itching is confined to localized areas. For the more general cases he uses an electric bath with the sinusoidal current.

Morris<sup>3</sup> treats pruritus ani with anodyne suppositories containing  $\frac{1}{2}$  grain of cocaine, or a 4 per cent. cocaine ointment, or a cocaine-glycerin lotion. He very properly warns against using this drug too strong, or for too long a time. He has found a large number of other applications useful in certain cases, such as menthol in strong sodic carbonate solution, oil of cade compresses, balsam of Peru in vaselin, the tars, belladonna suppositories, ichthyol, benzoin, tincture of iodine, gall ointment, black wash, lead-water, etc. The most obstinate cases require caustics, such as nitrate of silver one-half drachm to sweet spirits of nitre one ounce, or the actual cautery. Like the rest of us, he has found the purely neurotic forms less amenable to treatment than any others. The less local treatment done in them the better; constitutional remedies must be our reliance.

Truly, if there was ever an *embaress de richesse* we have it here. There may be wisdom in the multitude of councillors; there is certainly confusion in the multitude of remedies. And I cannot point out any very useful clue to the maze. So long as the real cause of the pruritus is unknown to us, as is but too often the case, our treatment is necessarily symptomatic, and we must try one of the approved remedies after another. I shall even venture to suggest another treatment that has done me good service in a number of cases during the past year, though it has also frequently failed. The high-tension current, applied with a large glass vacuum electrode where the affected areas are extensive, or with an anal or vaginal vacuum electrode for the cavities, has been at least as serviceable to me as any of the local applications. Where the itching is extremely localized I use a small-pointed carbon electrode to

<sup>1</sup> Journal de médecine; Dermatologisches Centralblatt, May 1, 1904.

<sup>2</sup> Monatshefte f. praktische Dermatologie, April 15, 1904.

<sup>3</sup> British Medical Journal; Medical Standard, December, 1904.

spark the spot with the high-tension current. This must be done cautiously, since the effect is cauterant.

**Psoriasiform Disease.**—This seems to be a more appropriate title for the class of diseases under consideration than psoriasis alone. The boundary line between a true typical psoriasis and many forms of seborrhœa and chronic eczema is so indefinite that cases that equally competent authorities would place in any one of these categories are constantly being met with. This led Unna several years ago to establish eczema seborrhoicum as a disease entity; and it is generally accepted as such by dermatologists to-day. Then came the recognition of psoriasiform eczemas and seborrhœas; until the tendency to-day is to obliterate to a very large degree the boundary lines between these three affections. This has gone so far already that some of the most recent German text-books practically treat psoriasis and eczema as one and the same disease. To a certain extent this is undeniably justified; though, of course, the great majority of the cases are readily placed in one or the other category, and the customary differentiation will be retained. The treatment of the diseases is essentially different; and the mere existence of a large number of mixed and boundary-line cases must not be allowed to affect our broader conceptions of diagnosis and treatment.

Under the heading of psoriasis I noted two years ago<sup>1</sup> two general schemes for the treatment of these cases which were representative of the methods in vogue in Germany and in France, respectively. Though satisfactory in a general way, they differed in some important respects from that in vogue in this country. Thus Chaneil rejects arsenic entirely for internal administration in his scheme, and pins his faith on large doses of the iodide of potash; a mode of treatment from which I have failed to get any positive results at all. He is afraid of chrysarobin when employed over extensive areas of the body, and restricts its use to the smaller lesions. This is by no means in accord with our experience here; I habitually use the drug in any required strength, and over the entire cutaneous surface if required. Morgenstern, on the other hand, rejects internal medication altogether, and relies on external applications alone. I am very sure that in the long run we get better, quicker, and more permanent results from a combined internal and external treatment.

The principles and rules that experience has taught me as regard this disease are as follows:

1. Though psoriasis is a disease that is incurable in the sense that its manifestations will almost certainly reappear, it is always temporarily curable, its relapses may be postponed for long periods, and we can do a very great deal by systematic and careful treatment, both during

<sup>1</sup> PROGRESSIVE MEDICINE, September, 1903, p. 136.



the attacks and the intervals of freedom from lesions, to keep the patient comfortable and fit for work. This latter is a vital consideration in our strenuous American life. A combined internal and external treatment is our best means of attaining these ends.

2. We find the disease affecting two distinct classes of patients. About half of our psoriasis cases occur in persons of good and even robust health, and these require only the specific internal and external treatment for the disease. The other half suffer either from various coincident affections and conditions that are always of influence in keeping up the skin disease, and are sometimes apparently its indirect occasion. Anæmia and chlorosis, rheumatism and gout, malarial infection, neurasthenia and hysteria in their various forms, gastrointestinal affections, etc., must be relieved before our antipsoriatic medication can be expected to have its proper effect. Hygienic measures, rest, change of air and scene, as well as the medication and regulations required for any definite lesions that may be present, are as important for the relief of the affection as the remedies to be recommended below.

3. Since most psoriatics have suffered from their disease for years their experience with the different forms of treatment is often large. Sometimes they think they know more about treatment than does their attendant. Exact rules must be laid down and rigidly adhered to. I refuse to treat these cases on the basis of an occasional visit and imperfect carrying out of instructions.

4. *Internal Treatment.* Iodide of potassium is useless in the great majority of cases; thyroid is useless and even dangerous. Arsenic is the only specific drug. It is best administered hypodermically in daily and gradually increasing doses. I employ by preference a 1 per cent. sterilized solution of sodium arseniate in distilled water, and begin with a dose of from three to five drops, in accordance with the age and size of the patient. I increase the dose daily by one or two drops, and push the medication until the first signs of arsenical saturation are apparent in the respiratory mucosæ; then the medication is kept up in slightly diminished dose. In many cases there seems to be almost no limit to the amount of the drug that can be administered in this way; I not infrequently go up to thirty drops or more. Sodium cacodylate can be used, but it is not so effective as the plain salt. Arsenic by the mouth, as Fowler's solution, arsenious acid tablets, or Asiatic pills is not so effective as the hypodermic medication, is prone to derange the gastrointestinal tract, and is only to be used in the exceptional cases in which the hypodermic administration of the drug is inadmissible.

5. *External Treatment.* This consists, in the first place, of the thorough removal of all crusts and scales from the lesions and the preparation of the diseased surface for the external applications. Benzine, or,

better, carbona, which is non-inflammable, should be employed to remove all fatty matters, and then hot water and green soap and the scrubbing-brush freely, and, if necessary, repeatedly used. The external application, if a solution or an ointment, is then thoroughly rubbed in with a brush; fingers are not efficient for the purpose; the ordinary "stencil" brushes sold in the paint stores are the ones that I usually employ.

Small or isolated patches can be covered with pieces of the 10 per cent. chrysarobin spread plaster or painted with chrysarobin collodion. More extensive areas require ointments; petrolatum is a suitable base. My first choice is tar in the form of the purified oleum rusci, my second is chrysarobin, and the last is pyrogallol. The birch tar is begun at 5 per cent. and rapidly increased in strength as required until it can be used pure. Chrysarobin is begun at 2 per cent., and may be increased to 50 per cent. if needed; when large proportions of the solid medicament are used oil must be used in the base to prevent the application being too dry. Pyrogallol may be used like chrysarobin, but the kidneys must be watched if it is used strong and over extensive surfaces. For the face and head I use only the white precipitate ointment, as a rule, or a mild naphthol-sulphur salve (1 : 500 to 1 : 100). Whatever the preparation used, concentration and vigor of application must be pushed until there is an erythematous reaction in the healthy skin surrounding the lesions. The patches are cured when they show as pale, whitish areas surrounded by stained and rosy skin.

6. The hygienic and general medication should be kept up for a long time after the body has been cleared. The hypodermic medication is stopped; but I always continue the administration of arsenic by the mouth for a month or six weeks longer. These measures are our best guarantee against an early return of the eruption. When that does happen treatment should be begun with vigor at the earliest possible moment.

Herxheimer<sup>1</sup> has lately proposed the employment of zinc peroxide, 10 per cent. in paraffin ointment, together with a varying amount of tar (up to 30 per cent.) as an antipsoriatic treatment. He claims that it is effective, does not discolor the skin or the clothes, does not affect the kidneys, and rarely causes dermal irritation. I have had no experience with the preparation. Dreuw<sup>2</sup> favors a compound formula, with which he has treated hundreds of cases successfully: Salicylic acid, 10; chrysarobin, ol. rusci, āā 20; green soap, vaselin, āā 25 parts. He thus combines the keratolytic, reducing, and peeling with the specific

<sup>1</sup> Deutsche medicinische Wochenschrift, 1904, No. 8.

<sup>2</sup> Münchener medicinische Wochenschrift, li., No. 20; Journal of the American Medical Association, July 16, 1904.

antipsoriatic properties of the drug. I do not like "shot-gun" medication of this order, nor have I found it necessary to have recourse to any of the numerous and less efficient substitutes for the standard drugs—anthra-robin, empyroform and the like. In fact, the success of the local treatment of psoriasis is less a question of drug selection than of careful and efficient employment of the remedy chosen.

**Tuberculosis of the Skin.**—Infection of the skin by the tubercle bacilli is shown most frequently, of course, by the appearance of lupus lesions;

FIG. 19



Psoriasis nummulata.

FIG. 20



Psoriasis. (Gottheil's cases.)

but the other form of tuberculosis, the chronic inflammatory and keratotic infiltration known as tuberculosis cutis verrucosus, is not uncommon. It is just as hard to cure as lupus itself; and, in my experience, is usually diagnosticated as a keratosis or a chronic eczema, and treated as such for a long time.

Kristan Anderson<sup>1</sup> reports an interesting case of the disease in which there is at least a strong presumption of the direct transfer of the contagion. The patient had a well-marked tuberculosis of the skin on the

<sup>1</sup> Zeitschrift des Norwegischen Aertztevereins; Dermatologisches Centralblatt, March, 1903.

back of his left middle finger, and marked swelling of the cubical gland of that side.

The only ascertainable source of infection was a tuberculous cow, in the killing and cutting up of which the patient had taken part some time before.

During the last few years a number of cases of tuberculosis of the skin following one of the exanthemata, and most commonly measles, have been reported. The lesions were usually of the disseminated variety. A case of the kind has been recently reported by Gaucher and Druelle,<sup>1</sup> in which there were follicular lesions scattered over the entire body. Adamson's<sup>2</sup> case followed measles, and the author gives a good review of the literature of the affection up to date. Hartzell<sup>3</sup> discusses the various forms of the disease, with especial attention to their treatment. This is essentially similar to that of other tuberculoses; much fresh air, out-door life, and superabundant food, especially of the easily digested kinds, milk, eggs, etc. The local treatment he tabulates as follows:

FIG. 21



Tuberculosis verrucosus cutis. (Dr. J. P. Oberndorfer's case.)

1. *Lupus Vulgaris*. Finsen light and Roentgen rays. The first is most applicable where the extent of the disease is small, as it otherwise takes too long. Radiotherapy is quicker, and, therefore, more suitable

<sup>1</sup> Annales de Dermatologie, December, 1903.

<sup>2</sup> British Journal of Dermatology, October, 1904.

<sup>3</sup> American Medicine, July 2, 1904.

for larger areas. Excision and transplantation can be used when there is a single area properly located for them.

2. *Tuberculosis Cutis Verrucosus*. The curette, followed by a caustic paste or a strong pyrogallol plaster. If the patient objects to this, radiotherapy may be tried.

3. *Lichen Scrofulosorum*. Cod-liver oil internally and externally. Vaseline inunctions after Crocker are good and unobjectionable.

4. *Ulcerative Scrofuloderms*. Keep aseptic; use stimulating mercurial ointments. Iodoform, euphraphin, aristol, and other iodine preparations are often useful.

Oberndorfer showed an interesting case of the verrucous variety of tuberculosis cutis at a recent meeting of the Manhattan Dermatological Society, a picture of which is appended (Fig. 21).

## SYPHILIS.

**Extragenital Chancre.**—The fact that the immense majority of chancres occur on the genitals is, of course, due to the thorough inoculation into an abrasion of the surface that is required for the reception of the syphilitic virus. Intimate prolonged contact between two individuals under circumstances likely to occasion lesions occurs, of course, in most cases, only during sexual congress. It is the custom to consider syphilis a venereal disease, and the designation is correct in so far as that it is usually contracted during intercourse. We have learned to appreciate the fact, however, that in a large number of cases infection has nothing to do with it. Apart from its usual mode of origin, syphilis belongs with the chronic infective granulomata. Its morbid anatomy closely resembles that of tuberculosis, lepra, etc., and its semeiology is like that of scarlatina, smallpox, and similar maladies.

Extragenital chancres are so common that they are not worth recording as a rule. Yet in certain locations they are still very rare. Gutzeit<sup>1</sup> notes a case of chancre of the conjunctiva, and has found the records of 21 previous cases. This one was gotten through "licking" the eye for an injury; a disgusting practice still in vogue in certain parts of the world. It appeared as a small, whitish, pea-sized spot, with a hard ridge around it. Brunon<sup>2</sup> encountered a nasal chancre in a boy aged seven years. The first symptom noticed was a papular eruption and mucous patches in the mouth. The child had had a "cold," with a mucosanguineous discharge from the nostrils some weeks before. The initial lesion was found on the left inferior turbinated bone, half an inch from

<sup>1</sup> Medical Review of Reviews, July 25, 1904.

<sup>2</sup> La tribune médicale; Medical Bulletin, March, 1904.

the nasal orifice. Questioning revealed the fact that the boy had the habit of introducing foreign bodies, lead-pencils, penholders, etc., into his nostrils, which he called "playing an elephant."

It is not unusual for the diagnosis to be missed in these extragenital cases. I can recall many instances of the kind seen by myself and others. Chancre of the finger is mistaken for a simple infection, as in the case I have mentioned. Chancre of the tongue I have seen taken for epithelioma. Chancre of the tonsil has been diagnosed as chronic tonsillitis; in one case under my care tonsillotomy had been done by a very competent laryngologist, and, of course, the operation wound would not heal properly. When I saw the patient four weeks later the site of the excision was still ulcerated, and there was a marked general adenopathy and a beginning macular eruption.

FIG. 22



Chancre of the lip. (Dr. J. P. Oberndorfer's case.)

In one class of cases, however, the difficulties in the way of a correct diagnosis are for a time insuperable. I refer to the so-called herpetiform chancres, where the lesion looks like an ordinary herpes or a herpes that has been infected with pus organisms. In the early stages there is not an amount of induration sufficient to settle the diagnosis, and the submaxillary gland swelling is neither marked nor characteristic. A case of the kind was shown by E. L. Cocks at the Manhattan Dermatological Association on May 5th of this year. It had been under observation for a number of days, and there had been no change under local treatment of what was apparently an ordinary infected herpes group on the lower lip. It was shown as an initial lesion in its earliest stage; but it was the unanimous opinion of all the members that neither its physical characters nor the small concomitant adenopathy justified the diagnosis, and it was not a chancre. Yet on May 23d, eighteen days

later, Dr. Cocks sent the patient to me for re-examination. The base of the supposed herpes was indurated so typically and so markedly that it could be recognized visually as a chancre; there was a very large and hard submaxillary adenopathy; there was a characteristic pharyngitis, and a general macular exanthem. The case was a lesson as to the importance of caution in the diagnosis of herpetic lesions, both in the usual situations and on the genitals. I feel that the utmost that we can say in a suspicious case is that it looks like a simple herpes, but it may develop into an initial lesion later on. The herpetic lesions may heal under any treatment, or under none at all, and the induration may develop later. Only the lapse of time can inform us positively whether there has been a syphilitic infection or not. Fortunately the herpeticiform chancre is very rare.

I append a photograph of a case of chancre of the lip shown at the same society by J. P. Oberndorfer. Typical cases like this, of course, present no difficulties of diagnosis (Fig. 22).

**Intramuscular Syphilotherapy.**—The treatment of constitutional syphilis by the hypodermic, or rather the intramuscular, administration of mercury has been strenuously advocated for years past by a gradually increasing number of writers, among whom I may count myself; and it seems that it is at last gaining extended acceptance and bids fair to come into general use. In the discussion of a recent paper on the subject, read by Klotz at the New York Academy of Medicine, almost every speaker advocated the method as the very best at our command. More than this, they expressed themselves in favor of the insoluble mercurial preparations, claiming in many cases that they had used them with the greatest satisfaction for a long time; and the consensus of opinion seemed to be that the salicylate of mercury in albolene, the preparation that I have used for years, was in all respects the most suitable one to employ. I can only add that the experience of the past year has fully confirmed me in the opinions that I have previously expressed. The intramuscular injection of the salicylate of mercury is far and away the best treatment of the disease. It is easy of administration if done properly; it is most efficacious and has few contraindications, and it is taken by the patients themselves not only without repugnance, but with eagerness when its advantages are once explained and appreciated.

The technique of the injections has been considered with some thoroughness in the reviews of the last two years.<sup>1</sup> One important point, however, requires further elucidation, and that is the instrument to be employed for the injections. The ordinary hypodermic syringe is not

<sup>1</sup> *PROGRESSIVE MEDICINE*, September, 1903, p. 177; September, 1904, p. 145.

suitable for the purpose, and most of the difficulties about which I am consulted by those using the treatment are due to its employment.

In the first place it is not convenient to use an instrument that is employed also for the ordinary aqueous injections for the administration of the heavy, oily solution. It necessitates a troublesome cleansing of the instrument with ether after each employment, and if the packing of the plunger is of rubber, leather, or asbestos it is almost impossible to get it thoroughly clean. Then, again, the ordinary syringe is too light for the rapid thrust that is part of the technique of painless injection. The graduations are too coarse to permit of accurate dosage where amounts are to be measured in drops or portions of a drop. All metal instruments are to be absolutely rejected; they are objectionable enough for watery solutions, since the condition of the fluid and the interior of the syringe, as well as the exact amount administered, are hidden; for an oily suspension of a heavy metallic salt, where settling occurs pretty rapidly, they are entirely inappropriate. The ordinary needles will not do; both their calibre and length is insufficient. A fairly large lumen is needed for the easy extrusion of the thick liquid containing the suspended powder, and they must be an inch and a half in length to reach well into the substance of the gluteal muscles. Finally, the needles must be of the slip variety to permit of quick removal and reapplication as recommended during the injection. It is true that I stated in the 1903 review that an ordinary hypodermic could be employed. Additional experience, more especially with the difficulties of others in carrying out the treatment, led me to very positively prefer an instrument especially adapted to the purpose.

Such an one need not be of all metal or all glass. I have mentioned the reason for objecting to the former. The latter in the market are not accurate or minute enough in their graduation, and, in addition to their fragility, are entirely too light. The statement has been made that there should be no metal in contact with the solution in a syringe designed for mercurial injections. This is true for the soluble salts, but not for the insoluble suspension that I recommend. This has absolutely no effect upon metal, no matter how long it remains in contact with it. In fact, the oily fluid acts as an excellent preservative for the metal. The bright and polished surface of the solid piston-rod that is in the syringes that I employ never even become dimmed; and the needles for the same reason last almost indefinitely. There is no oxidation and clogging with rust, as with watery solutions. In point of fact I do not clean the interior of my syringe. The suspension itself is sterile, and there is no chance for contamination between injections, when in the closed syringe the entire lumen is occupied by the solid metal plunger.

I have lately had an instrument constructed for the purpose of making



these injections that is in every way suitable for them, and that I have used with great satisfaction for a year past, and have described elsewhere.<sup>1</sup> The barrel is of glass, narrow, and accurately graduated in minims, so that accurate doses in drops and fractions thereof can be readily given. The plunger, a solid metal rod, fits this so accurately that there is practically no space at all between it and the sides of the tube and the end pieces when it is closed. The piston head is large and heavy, so as to give the necessary impact weight; and it is flat, so that the filled instrument can be stood on end, and accidental contamination of the needle avoided. The needles are of the right size, and the slip caps are accurately fitted, so that they act as well as the usual screw arrangement.<sup>2</sup>

Among the many who have advocated the hypodermic as the routine treatment of syphilis during the past year I may mention Wickham,<sup>3</sup> Fuller,<sup>4</sup> Trémolières,<sup>5</sup> Bréton,<sup>6</sup> Emery and Druelle,<sup>7</sup> Barthélemy,<sup>8</sup> Ledermann,<sup>9</sup> Levy-Bing,<sup>10</sup> and Grosz.<sup>11</sup> A minority of the writers still use the soluble mercurials; but the trend is entirely toward the employment of the insoluble suspensions. Laborie<sup>12</sup> advocates the mercurial of Blonquist, claiming that it acts quicker even than gray oil. Colloidal mercury has been used by some experimentors, but Barthélemy, Lafay, and Levy-Bing,<sup>13</sup> reporting on it, state that they have used it in 12 cases, making 160 injections, and that they do not like it. They used a solution of 0.10 cgm. in 10 c.c. of distilled water, of which 1 to 2 cgm. was the amount required daily.

They found that there was often diarrhœa and stomatitis; that indurations were frequent; that there was always pain for several hours after the injections; and that the therapeutic effects were inconstant and insufficient.

Waelisch<sup>14</sup> has tried *Paulsen's serum* in guinea-pigs, and found it toxic; he mentions the fact that Appel and himself had treated 14 human

<sup>1</sup> International Clinics, vol. iii., fourteenth series.

<sup>2</sup> Obtainable from C. Spindler, 157 East Seventy-second Street, New York City.

<sup>3</sup> Practitioner, London, July, 1904; Journal of the American Medical Association, August 20, 1904.

<sup>4</sup> Monatshefte f. praktische Dermatologie, June 1, 1904

<sup>5</sup> Presse médicale, 1903, No. 24; Monatshefte f. praktische Dermatologie, June 1, 1904.

<sup>6</sup> Journal des praticiens, 1903, No. 45.

<sup>7</sup> Presse médicale, 1904, No. 12.

<sup>8</sup> La Syphilis, February, 1904.

<sup>9</sup> Deutsche medicinische Presse, 1904, No. 17.

<sup>10</sup> Les injections mercurielles intramusculaires dans la syphilis; Naud, Paris, 1903

<sup>11</sup> Archiv f. Dermatologie und Syphilis, October, 1904.

<sup>12</sup> Journal des maladies cutanées et syphilitiques, January, 1904.

<sup>13</sup> La syphilis, February, 1904.

<sup>14</sup> Archiv f. Dermatologie und Syphilis, July, 1904.

cases with it without harm, but with results that, to say the least, were doubtful.

Lane<sup>1</sup> has also used the serum, but has had no special result from it except when combined with other and recognized antisyphilitic treatment. This result, or rather this want of them, is of interest in view of the energy with which an antisyphilitic serum is being pushed in this city (New York). What little I know of it has not led me to have any confidence at all in it.

Since the injections correctly given are almost painless, the only legitimate objection to them is the possibility of the occurrence of embolism from the injection of the oily suspension directly into the venous circulation. Personally, I know nothing about this accident; I have never encountered it. I have no exact figures at hand as to the number of injections that I and my assistants and the staff of the City and Lebanon Hospitals give in the course of the year; but it must be between 1500 and 2000 annually. I attribute this safety entirely to the precaution, which will bear repetition here, of disconnecting the needle from the syringe after the puncture, and watching the lumen of the needle before completing the injection. I have said in a publication made some time ago that it had hardly ever happened to me to engage the orifice of the needle in the lumen of a vein. I have had the experience, however, a number of times during the past year; and I have always immediately withdrawn the needle, made a new puncture, and made the injection in another spot.

I am not aware whether Voss,<sup>2</sup> who has made a study of this complication, adopts any similar precaution; but he has shown conclusively that when embolism does occur as a consequence of the salicylate injections it is a harmless complication. He found the symptoms invariably slight and transient. He observed it, it may be noted, only 13 times in 13,671 injections given in 1373 patients; once in 1000 injections. Isolated cases have been reported in which the symptoms, pain, dyspnoea, cough, bloody expectoration, etc., have been severe; but in almost every instance they passed off rapidly and prompt recovery ensued.

**Postmortem Signs of Heredosophilis.**—This subject is of some practical importance. The determination of the cause of a miscarriage or of an infantile death may be necessary for the treatment of the mother and the prevention of the recurrence of the accident.

A very excellent *résumé* of the postmortem signs of the syphilitic infection is given by Helker;<sup>3</sup> they may be classified as follows:

<sup>1</sup> Practitioner, London, July, 1904.

<sup>2</sup> Dermatologische Zeitschrift; Journal of the American Medical Association, January 7, 1905.

<sup>3</sup> Monatshefte f. praktische Dermatologie, October 1, 1904.

## I. *Macroscopic Signs.*

### A. *Positive signs* (one suffices).

1. Marked osteochondritis of the second grade (irregular (cartilage-bone junction at the lower femoral epiphysis, enlargement of the cartilaginous calcification zone).
2. Marked increase of weight and hardening of either the spleen or the liver. The liver must be characteristically discolored and of increased elastic resistance.
3. Cirrhotic processes in lungs or liver.
4. Marked white pneumonia.
5. Papular or vesicular syphilides.

### B. *Probable signs* (two needed for diagnosis).

1. Osteochondritis of the first grade.
2. Marked increase and hardening of the liver, spleen or kidneys.
3. Gummata (to be distinguished from tubercles and spots of decomposition).
4. Thymus abscesses.
5. Not marked white or interstitial pneumonic processes.
6. Hardening of the pancreas.
7. Macular syphilide (fades mostly; to be distinguished from decomposition spots).
8. Papular, vesicular, and pustular syphilides altered by maceration.

### C. *Uncertain signs* (if these only are present, the microscope is necessary for diagnosis).

1. All the probable signs when not well marked or obscured by maceration.
2. Erythemas.
3. Circumscribed thickenings of the intestinal wall.
4. Multiple hemorrhages.
5. Ascites.

Less than normal size and weight. (All these uncertain signs may occur in the nonsyphilitic subject.)

## II. *Microscopic Signs.*

1. Kidneys. Vascular changes, especially a cellular infiltration of the walls of the smallest cortical arteries and their neighborhood, is pathognomonic of syphilis. It is hardly ever absent; if present, no further search is needed.
2. Kidneys. Connective-tissue changes, diffuse infiltrations, interstitial inflammations, cirrhotoses, circumscribed infiltrations and gummata. These are pathognomonic, but they are not often seen in foeti and infants.

3. Kidneys. Epithelial changes. Very rarely seen in foeti.
4. Developmental changes.
  - (a) Increased development (epithelial proliferation).
  - (b) Hindered development (lessening of number of the glomeruli, presence of pseudoglomeruli, even at birth; growing of "neogenetic" tissue beams into the parenchyma.
  - (c) Broadening of the mesenchyme.
  - (d) Developmental disturbance of the epithelium of the tubules and the glomeruli.

(These developmental changes are not especially useful practically, since they are not universally accepted.)
5. Spleen. Cellular infiltration of the walls of the medium and larger vessels.
6. Thymus. Interstitial inflammation with secondary shrinkage.
7. Pancreas. Interstitial inflammation.
8. Liver. When there are marked interstitial inflammatory changes, arteritic processes, or undoubted gummata, the diagnosis is not difficult. It may be hard to make, however, in cases in which disease is not marked.
9. Lungs. Diagnosis difficult in early cases; easy when there are marked white or interstitial pneumonic processes.

I regard the points of macroscopic diagnosis as by far the most useful, since neither the time nor the facilities for extended microscopic examinations are available in the great majority of cases. The list may prove useful in helping to come to a decision in doubtful cases.

**Syphilis in the Newborn.**—The syphilitic infant may be born apparently healthy; but the first signs of the disease are usually manifested during the first three or four weeks of extrauterine life. Exceptionally they may be postponed until the third or fourth month; and they always appear before the sixth. Cases of heredosyphilis in which there are said to have been no symptoms until much later are instances in which the less marked manifestations of the disease have not been recognized. If more attention were paid to these slighter signs of the inherited disease the appropriate treatment would be instituted earlier and we should have less of the severe and fatal cases than we do.

Leaving out of account considerations of the symptoms in the parents or their past history, the birth of an imperfectly developed child, under weight, with little hair and undeveloped nails, should at least awake suspicion. There is often a peculiar brownish discoloration of the skin, especially of the face, as was first noticed by Trousseau and Hensch. The integument is more or less wrinkled from the paucity of sub-

cutaneous fat, and the countenance is peculiarly weazenized, and looks like that of an old man. When an infant of this appearance develops a persistent coryza our suspicions of syphilis become strong.

We are all more or less familiar with the various eruptions of the macular, papular, and bullous forms that mark the hereditary disease; less so perhaps with the diffuse infiltration and reddening of the palms and soles that occur. The skin in these locations is crimson, swollen, smooth, and glistening, and present an appearance so characteristic that the diagnosis can be made on that alone. Moist papules around the mucous orifices, mucous patches, etc., are characteristic signs. The liver and spleen may be enlarged; digestive disturbances soon set in, and the infant begins to fail.

A less common set of symptoms of lues in the newborn is the occurrence of a hemorrhagic eruption, possible in conjunction with hemorrhages from the internal organs. Isham<sup>1</sup> records such a case, which is precisely similar to the one of my own mentioned below. The child, born apparently healthy, had a most obstinate navel hemorrhage on the twelfth day, followed by extensive blood extravasation under various parts of the skin. Cure was rapid under mercurial treatment. Wilson<sup>2</sup> records not less than 10 cases that have come to the autopsy table. There were hemorrhages of various internal organs, together, in most cases, with other symptoms of heredosyphilis.

In the case that I have recorded<sup>3</sup> the child was born apparently healthy save for a large naevoid tumor in the skin of the left lumbar region, and several similar but smaller ones on other parts. From these there occurred during the second week of life a causeless, most violent and uncontrollable hemorrhage, which continued until death. Neither styptics, compression, nor the actual cautery would control it. At the same time there occurred an eruption of hemorrhagic vesicles all over the body, including the palms. They looked exactly like varicella vesicles, save for their hemorrhagic contents. There occurred hemorrhages from the stomach and bowels, and finally there was blood in the urine. The child died at the sixth week.

Birrenbach<sup>4</sup> calls attention to the importance of *micromelia* in the diagnosis of hereditary syphilis. There is a stoppage of growth in the cartilage-bone zones, followed by fibroid degeneration. Thus we get large epiphyseal cartilages and shortened diaphyseal bones. Hutinel<sup>5</sup>

<sup>1</sup> Cincinnati Lancet-Clinic; Dermatologisches Centralblatt, May, 1904.

<sup>2</sup> Journal of the American Medical Association, February 11, 1905.

<sup>3</sup> Archives of Pediatrics, June, 1898.

<sup>4</sup> Inaugural Dissertation, Griefswald; Archiv f. Dermatologie und Syphilis, April, 1904.

<sup>5</sup> La syphilis, vol. i., No. 2; Journal of Cutaneous Diseases, June, 1904.

calls attention to the syphilitic ulceration of the umbilicus as a reliable sign of the disease. At his service at the Hôspice des Enfants-Assistés about 4000 newborn infants are brought yearly; and the grave question must be quickly decided in each case, and with little or no knowledge of the parents, whether or not the child is syphilitic. The results of error, he says, are serious; for if a luetic child is put out to nurse, the foster-mother and her family may contract the disease; while if a healthy child is sent to the nursery to be bottle-fed, it is almost sure to die from gastrointestinal disturbance before long. The ulceration of the navel that he describes appears as a lardaceous infiltration and develops into a true gumma, which finally breaks down. It can be distinguished from the commoner infective inflammation of the navel by the absence of pain, tenderness, or any constitutional symptoms.

**Professionally Acquired Syphilis.**—Far more frequently than is commonly supposed the physician is accidentally inoculated with the specific virus in the course of his professional work. Blaschko,<sup>1</sup> in a recent article, goes so far as to call it a "berufskrankheit," a professional disease of doctors. The risk of contagion is constant, more especially for the gynecologists and obstetricians, and only to a slightly less degree for those engaged in genitourinary work. The profession in general does not hear much of these cases; but syphilographers see a number of them.

Unfortunately, it is the rule rather than the exception for the diagnosis not to be made early. The chancre on the finger is usually considered a simple infection, or even a tuberculosis, and is neglected or mistreated under that supposition. In a case that has been under my care for the last two years the surgeon who had the case at first used all kinds of local applications, incised, curetted, and finally proposed amputation of the terminal phalanx of the patient's index finger. Luckily, the patient himself began to think that his cephalalgia and general symptoms were too severe for a simple mild infection; his suspicions were aroused, and when he came to me both his skin and his mucosæ showed indubitable evidences of the disease. In fact, I have come to a point at which I regard any chronic, obstinate, more or less painless lesion on the hand of a physician with suspicion.

It seems to be a fact that infection may occur without any ascertainable point of entrance of the virus. With ordinary patients this is a matter of not very infrequent occurrence; but, of course, we can never entirely exclude the element of deception. But that it should occur in the person of trained observers with every interest opposed to deception would tend to make us believe in the occurrence of the French "syphilis d'emblée," syphilis without a primary lesion. Blaschko relates a case

<sup>1</sup> Berliner klin. Wochenschrift, December 26, 1904.

in point, in which a general roseola was the first symptom of the disease, without any point of entrance of the virus being discoverable. He says the patient was a very careful, painstaking, and conscientious physician. I have very recently had a similar case. This physician consulted me for a perfectly unmistakable tertiary circinate syphiloderm of the neck; he had also distinct symptoms of tabes. He was a skilled observer, and had been constantly on the lookout for an infection which his work exposed him to, and which he dreaded. Yet at no time in the past had he ever had a suspicious lesion of any kind on the skin or mucosæ. In one of Blaschko's cases infection was unmistakably derived from the dissection of a syphilitic subject twenty-four hours after death.

There seems to be some ground also for the supposition that syphilis in physicians is not infrequently of exceptional obstinacy and severity. This may be due to the fact that, strange as it seems, they but too often lead unhygienic lives which they would not permit patients under their care to do; they often habitually overwork themselves, and deny themselves proper exercise and recreation. Perhaps, also, their very familiarity with the disease leads them to minimize its dangerous possibilities. But the most important factor, in my estimation, is the fact that their treatment is usually imperfect and insufficient. I am loath to say it, but I know of no more unsatisfactory class of patients to treat for this disease. They seek and follow imperfectly a multiplicity of advice, sometimes divergent; they often follow their own rather than their attendant's judgments and they are too busy to attend to themselves as soon as urgent symptoms have been relieved. I can instance two pregnant and recent examples. In the first there has been an iritis of a most exceptionally obstinate nature, persisting in greater or lesser degree for two years in spite of all the measures that a well-known ophthalmologist and I together could employ. Yet the patient has not been able to take the vacation that he urgently needs, even in summer; and he must continue his nightwork, keep up his reading, as far as possible, etc. In the other case the patient himself decides how often he shall come for the injections and what the dose shall be. It has happened to me more than once that, much as I dislike to do so, I have been compelled to relinquish the treatment of such cases.

Now, as regards the avoidance of accidental infection, which, after all, is the chief thing. I see a great deal of syphilis in public and private practice; in the former I systematically refuse to make any digital examination at all unless I am perfectly sure that my hands are free from the slightest crack, fissure, or hang-nail, etc. An assistant whose hands are entirely whole examines if I cannot. In private practice I always use finger-cots; they are cheap enough to be thrown away after use on a suspicious case. I think this is much better than relying on collodion,

or 2 per cent. nitrate of silver. If, after an examination, I find a lesion that I was unaware of, I thoroughly apply pure carbolic acid on a tooth-pick into its depths, and if the case has been an unmistakably contagious one I use nitric acid in the same way.

The infected physician's professional work need not be abandoned, save, of course, the manual part of it when there are lesions on the hands. As Blaschko says, the physician's family life suffers more than does his professional; but our profession, he adds, frequently requires great sacrifices from its members; and experience has shown that they are borne with courage and dignity even under these circumstances.



# DISEASES OF THE NERVOUS SYSTEM.

By WILLIAM G. SPILLER, M.D.

## DISEASES OF THE BRAIN.

**Tumors of the Brain.** LOCALIZING SIGNS. The paper by James Collier on the false localizing signs of intracranial tumors is exceedingly interesting and important. He shows how apparently localizing signs occurring late are of little diagnostic value. In one case in which a glioma of the left prefrontal region was found, the patient had had late signs suggestive of a tumor in the posterior cranial fossa, viz., complete nerve deafness of the left ear, paralysis of the left external rectus, and left peripheral facial paralysis. In another case in which a cerebellar tumor was found, Jacksonian epilepsy developed late. False localizing signs were present in 20 cases out of the 161 cases studied. In two cases the false localizing signs were caused by vascular lesions (hemorrhage, thrombosis), situated at a distance from the growth. In the other cases the false signs were attributable to the indirect results of intracranial tumors. They were met with in 13 per cent. of the supratentorial tumors and only twice among 54 cases of subtentorial tumors. Paralysis of cranial nerves occurring late is supposed by Collier to be caused by the shifting backward of the brain stem from the supratentorial pressure. The paralysis of the sixth nerve is more common as an indirect result of intracranial tumor than paralysis of any other cranial nerve. The sixth nerves are directed straight forward; the shifting backward of the brain is supposed to cause much traction upon these nerves and only a little on nerves that are directed transversely. Collier finds slight weakness of the lower part of the face very common when there is a supratentorial tumor in any situation. Palsy of the cranial nerves is not of common occurrence as an indirect result of intracranial tumor. It was present in 16 of the 161 cases, or 10 per cent.

Collier<sup>1</sup> believes that the occurrence of Jacksonian epilepsy long after the general signs of intracranial growth have appeared is to be disregarded as of localizing value, as it may be caused by hydrocephalus. The most common cause of Jacksonian epilepsy, he believes, is idiopathic epilepsy. Bilateral spastic paresis occurring in the late stages of intra-

<sup>1</sup> Brain, Winter, 1904, vol. xxvii. p. 490.

cranial tumor he attributes to cortical wasting, resulting from secondary distention of the ventricles. If it occurs early it usually indicates that the tumor is in a region where the pyramidal tracts are close together. The combination of bilateral spastic paresis with cranial-nerve palsies, usually a sign of implication of the brain stem, may be produced in the late stages of a growth in any situation within the skull.

The unreliability of what appear to be localizing symptoms in brain tumor is shown in a case reported by Souques.<sup>1</sup> Hyperæsthesia in the area of the left trigeminus and bilateral deafness, with other symptoms of tumor, suggested the base of the brain as the seat of the lesion. The tumor was found at the necropsy in the left frontal lobe, but a correct diagnosis during the life of the patient seems to have been impossible. The bilateral deafness is especially worthy of note. Souques believes that cerebral tumors, especially when they develop rapidly, may cause alteration of the internal ear by action at distance. The deafness is caused by increase in the pressure of the cerebrospinal fluid, and resembles the blindness resulting from papillitis occurring with brain tumor. Deafness seems to be uncommon in cases of brain tumor, but Souques suggests that it may be more common than we suppose. The examination of the internal ear is difficult and is rarely made in these cases, and deafness is not so readily observed by the patient as blindness.

**TRAUMA AS A CAUSE OF TUMOR.** The interesting feature in a case of brain tumor reported by Liefmann<sup>2</sup> is the relation of head injury to tumor. The patient received a severe wound in the head in the right parietal region. About eight months after the injury the general symptoms of brain tumor began to be manifest, and about a year after the appearance of these symptoms an operation was performed, and a sarcoma was found exactly under the scar. A causal relation of the injury to the tumor formation in this case seems to be clearly demonstrated.

**TUMOR SYMPTOMS CAUSED BY OTHER CONDITIONS.** In an exceedingly important paper Nonne<sup>3</sup> shows how the symptoms of brain tumor may be present in a case in so marked degree that one could hardly doubt the existence of tumor, and yet the patients recover and remain well. Evidently, therefore, some other lesion must have caused the symptoms. He reports a number of remarkable clinical cases in support of his statements. The diagnosis of syphilis is convenient, but not supported by facts; neither can these cases be regarded as manifestations of hysteria or epilepsy, or of intoxication or infection. In the 2 cases of this character with necropsy described by Nonne, the findings did not explain the symptoms; in a third case anæmia seemed possibly to be the cause. The

<sup>1</sup> *Revue neurologique*, July 30, 1904, p. 727.

<sup>2</sup> *Berliner klin. Wochenschrift*, September 5, 1904, No. 36, p. 949.

<sup>3</sup> *Deutsche Zeitschrift für Nervenheilkunde*, Nos. 3 and 4, vol. xxvii. p. 169.

symptoms may indicate a tumor of the cerebrum or cerebellum and may or may not be influenced by mercury, and are probably not caused by hydrocephalus. Nonne compares these cases to those of hemiplegia without organic findings reported by Jacobson and others. The subject, of course, has great importance and teaches that the diagnosis of brain tumor should be made guardedly.

**TUMOR AND CEREBRAL SYPHILIS.** In a report of two cases of cerebral syphilis Mills<sup>1</sup> shows how closely this disease may resemble brain tumor. He remarks that if the signs and symptoms of encephalic disease can be referred to a single location in the brain, the chances are against cerebral syphilis, although this rule is not without exceptions. He also points out that a large tumor of one cerebral hemisphere, not reaching to the base, may cause signs of involvement of cranial nerves, probably by pressure, and in this way cause symptoms of multiple lesions as in syphilis. As a rule, the symptoms of brain tumor develop more slowly than do those of syphilis. Mills also refers to the great difficulty in distinguishing clinically between multiple sarcomatosis and syphilis.

**PNEUMATOCELE OR AIR TUMOR** of the cranium is very rare, as L. L. McArthur<sup>2</sup> states. He has collected the reports of 33 cases in the literature; 23 of these were occipital, 10 frontal. McArthur adds 1 more case to the list. The condition should not be confused with emphysema of the scalp, as it differs from this in being one air-containing sac; emphysema consisting of numerous finely divided bubbles of air in cellular tissue. These tumors, according to McArthur, have for their external wall the skin and periosteum and all tissue between. They vary in size according to their age; they may be as large as a hazel-nut or sufficient to give the head a circumference of two and a half feet. They are of irregular shape, because of the varying degree of attachment of the periosteum to the bone. The irregularity is chiefly determined by the stronger attachment of the periosteum at the sutures. The tissues covering these tumors are of normal appearance if complications are absent. The tumors are not usually sensitive when palpated and give a sense of extreme elasticity or of exaggerated fluctuation. They do not pulsate, but may diminish in size when pressure is applied. The patient frequently hears a sound as of rushing air or water in the ear when the tumor is occipital, and in the nose or throat when frontal. There may be so much fluctuation as to give the impression of a fluid collection, but the finding of a bony outgrowth or ridge at the line of junction of the tumor with the normal scalp will prevent this error. Where the tumor can be partially reduced by pressure, numerous bony irregularities may be felt within it. Efforts on the part of the patient to inflate the middle ear

<sup>1</sup> University of Pennsylvania Medical Bulletin, May, 1904.

<sup>2</sup> Journal of the American Medical Association, May 6, 1905, p. 1418.

or the use of the Politzer bag will usually restore the tumor to its former size. The tumors are formed by a connection with air-containing sinuses.

Auscultation is negative. Percussion offers the most important diagnostic sign, as it gives a highly exaggerated tympanitic note. The causes are trauma and suddenly increased pressure within the buccal and oral cavities. In 16 of the cases, about 50 per cent., the tumor has occurred spontaneously, so far as history of injury or of inflammatory conditions go.

The majority of these tumors were observed in the preantiseptic era. Compression has given temporary success, but recurrences have been frequent, and the compression is painful. Even when aspiration was first done the results were much the same. Opening and packing the cavity have caused suppuration, but since the era of antiseptic surgery this danger has been greatly lessened, and this seems to be the means of treatment preferred by McArthur.

**CEREBELLAR TUMOR.** It is sometimes impossible to decide on which side of the cerebellum a tumor is present, even after we feel reasonably sure that a tumor is in the cerebellum. Mann<sup>1</sup> thinks that when hemiataxia exists, without disturbance of sensation, the tumor is in the cerebellar lobe on the side of the ataxia. In a case which he has reported recently the sign failed to the extent that the tumor was in the occipital lobe, but on the same side as the ataxia. Mann thinks pressure of the tumor upon the cerebellum caused the hemiataxia. The Babinski sign was present on the same side as the ataxia, the left, although the tumor was in the left occipital lobe. This was evidently a case in which the Babinski sign was unreliable. It may be well to wait for further observation before we accept unconditionally the statement that hemiataxia without sensory symptoms indicate that a tumor is to be found in the cerebellar lobe on the same side as the ataxia.

Oppenheim<sup>2</sup> believes that an important sign of cerebellar tumor is a loss of the corneal and conjunctival reflex, with or without anaesthesia of these parts on the side of the tumor. Sensation in the remainder of the trigeminal territory may be normal. Careful study should be directed toward the reliability of this sign.

A very valuable series of papers regarding cerebellar tumors has recently been published. In the paper by C. K. Mills,<sup>3</sup> the headache, nausea and vomiting, optic neuritis, vertigo, nystagmus, paresis or paralysis, the position of the head, hemiasynergia, ataxia, tremor, etc., are discussed. It is difficult to do justice to this series of papers in the

<sup>1</sup> *Monatsschrift für Psychiatrie und Neurologie*, June, 1904, p. 409.

<sup>2</sup> *Berliner klin. Wochenschrift*, April 10, 1905, p. 448.

<sup>3</sup> *New York Medical Journal*, February 11 and 18, 1905.

space at our command, and it may be better to allow the reader to refer to the original papers, as they are published in a journal accessible to all. Dr. Mills reports a number of important cases of cerebellar tumor with operation.

C. H. Frazier discusses cerebellar tumors from the surgical side, and this paper will probably be mentioned elsewhere in *PROGRESSIVE MEDICINE*; as will, doubtless, the excellent paper by G. E. de Schweinitz on the ocular signs of cerebellar tumor.

The varieties of cerebellar tumor are discussed from a pathological aspect by T. H. Weisenburg.

**TUMOR OF THE MEDULLA OBLONGATA.** It is well known that a glioma of the medulla oblongata may cause symptoms much less severe than might be expected from a tumor in so vital a part of the nervous system. A case of intramedullary tumor of this region, reported by v. Rad,<sup>1</sup> resembles, in its clinical features, one of extramedullary tumor of the same region reported by me a year or two ago. In v. Rad's case the first symptom was pain in the back of the neck, which soon became severe. Paralysis of the right upper limb, beginning in the shoulder, developed, and this was followed in about seven months by paralysis of the right lower limb. In about three-quarters of a year after the right upper limb became paralyzed the left upper limb became paralyzed, the weakness first being manifest in the shoulder; five months later the left lower limb was implicated. Pain and temperature sensations were diminished in the left limbs, and touch and sense of position on the right side. The disturbance of motion was more pronounced in the right side. During the few weeks preceding death epileptic attacks, dysphagia, and dyspnoea developed. The medulla oblongata was found much enlarged by a glioma.

It seems remarkable that this progressive paralysis of the limbs, first of an upper and then of a lower limb, could be caused by a tumor within the medulla oblongata, and yet it unquestionably was so caused in v. Rad's case.

**Cerebrospinal Rhinorrhoea.** Schwab and Green<sup>2</sup> report a case of cerebrospinal rhinorrhoea with retinal changes, and refer to the fact that St. Clair Thomson, in 1899, collected the records of 20 cases in which a watery flow from the nostril could with reasonable certainty be regarded as originating from the cranial cavity. Thomson added the report of a case of his own. Some of the cases have been accompanied by optic neuritis or optic atrophy. The case that Schwab and Green have studied differed from all others in the preservation of a high and almost equal degree of visual acuity in both eyes, despite indubitable evidence of

<sup>1</sup> Deutsche Zeitschrift für Nervenheilkunde, No. 3, vol. xxvi. p. 293.

<sup>2</sup> American Journal of the Medical Sciences, May, 1905, p. 774.

inflammatory and atrophic changes in both optic disks. The type of optic neuritis with cerebrospinal rhinorrhœa is usually severe and destructive of sight, but a milder form may occur. The optic nerve changes are an integral part of the symptom-complex. The nasal discharge may be recognized as cerebrospinal fluid, according to Halliburton, when it is constant and long continued, is perfectly clear, free from taste, smell, and sediment; when albumin and mucin are absent from it, and when Fehling's solution is reduced by it. The etiology of this affection is unknown, and it is uncertain whether it is the result of inflammation or of some anatomical defect. The ocular changes, according to Schwab and Green, seem to indicate that there must in these cases be some process of an inflammatory or circulatory character, which first appears in the optic nerve and then causes the release of cerebrospinal fluid through the nose.

**Encephalitis.** Southard and Sims<sup>1</sup> have observed hemiplegia in a boy convalescing from *scarlet fever*. Hemorrhagic encephalitis of the parietal lobes was found.

**PERTUSSIS AS A CAUSE OF ENCEPHALITIS.** Almost any of the infectious diseases may occasionally cause serious alteration of the nervous system, and this is equally true of pertussis. J. H. W. Rhein<sup>2</sup> has collected a large amount of literature bearing on the subject, and has reported the following interesting and important case: A child, aged twenty-one months, developed during an attack of pertussis a spastic diplegia, with later imbecility and general convulsions, and died at the end of seventeen months. The brain and spinal cord showed numerous microscopic hemorrhages, distention of the perivascular spaces, and cellular infiltration about the vessels and within the cortex of the paracentral lobule. The pia was thickened in places and infiltrated with cells, and the pyramidal tracts showed degeneration. The condition was hemorrhagic meningoencephalitis.

**Polioencephalitis Superior.** An interesting case of ocular palsy is reported by Siemerling.<sup>3</sup> A woman, aged fifty-five years, who had contracted the morphine habit, presented complete right external ophthalmoplegia with ptosis; also limitation of movement in the muscles innervated by the left oculomotor nerve, especially of upward movement, and to a less extent of inward and downward movement. Outward movement on the left side was good. Ptosis of moderate degree was present on the left side. The eye-grounds were normal. The pupils reacted slightly and were contracted because of the morphine. These ocular defects had existed since the patient was three years old, and other

<sup>1</sup> Journal of the American Medical Association, September 17, 1904, p. 789.

<sup>2</sup> Ibid., March 4, 1905, p. 697.

<sup>3</sup> Archiv für Psychiatrie, No. 1, vol. xl. p. 41.

symptoms were said to have been absent. The oculomotor and trochlear nuclei were much degenerated and their places were occupied by what appeared to be the remains of an old hemorrhage. The trochlear nucleus on the right side was entirely destroyed, and on the left side a mere trace of it was found. The oculomotor nucleus on the right side was almost destroyed, merely a portion of the proximal end persisting. The left oculomotor nucleus was much implicated. The right intramedullary portions of the oculomotor fibres were much degenerated; the left were a little better preserved. The cause of the hemorrhage was difficult to determine, as it had developed without trauma and without symptoms of intoxication or infection. The early age was contrary to a diagnosis of vascular disease. There was no reason to suspect syphilis or tuberculosis. The lesions were not unlike those occurring in acute anterior poliomyelitis, and Siemerling seems to incline to this diagnosis, although he does not express a positive opinion.

**Aphasia.** Congenital word-blindness is a condition that probably is more common than the number of reported cases indicates—viz., 14 reported by six authors. Sydney Stephenson<sup>1</sup> has recently added 2 more to the list. There is probably, as he says, a congenital condition not necessarily associated with any other defect, mental or physical, in which the learning of letters or of words from printed or written characters is difficult or impossible. The condition may be caused by a congenital defect in the visual memory centre for letters and words. Most of the cases have been in males. The auditory memory usually has been highly developed. One of Wernicke's patients could speak two languages correctly. In some of these cases much improvement may be expected, but this will depend on early and proper training, hence the defect should be recognized so soon as possible.

C. K. Mills,<sup>2</sup> in a recent paper, returns to the subject of aphasia upon which he has written so often and so well. The island of Reil is, according to his views, an important part of the zone of speech, but probably only its anterior portion constitutes conjointly with Broca's area the centre of motor speech. He refers to two recent cases which he regards as affording evidence of the existence of a graphic centre, and to a case reported by him in 1889 in which paralysis was limited to the tongue, lips, and lower face, with slight implication of the palpebral orbicular muscle of the same side. Speech was entirely unaffected, except as regards the effect on articulation caused by the lingual, oral, and slight facial paresis. The necropsy showed cortical softening involving the

<sup>1</sup> *Lancet*, September 17, 1904, p. 827.

<sup>2</sup> *American Journal of the Medical Sciences*, September, 1904; *University of Pennsylvania Medical Bulletin*, May, 1904; *Proceedings of the Philadelphia County Medical Society*, September 30, 1904.

lower extremities of the central convolutions. The case seems to indicate that the true speech centre is confined to the subfrontal convolution and a part of the insula and does not extend into the lower part of the precentral convolution.

**Mind Blindness.** The case of mind blindness reported by Ward A. Holden<sup>1</sup> seems to be unique, because the patient had for a long period a form of mind blindness, and yet no lesion was found on the mesial surfaces of the occipital lobes or in the optic radiations, as is the rule in these cases. Symmetrical areas of softening were present in the outer cortex of each cerebral hemisphere, including on each side the angular and supramarginal gyri. Clinically, the case was one of dementia after hemiplegia, with aphasia, apraxia, and an interference with vision, which much of the time amounted evidently to total blindness. When the man walked his wife always led him; because of muscular weakness, and, therefore, it was difficult for her to judge of his power of orientation. On some days he bumped into objects; on others he seemed to see. Holden states that his case does not belong to the usual form of mind blindness. Apraxia, according to Holden, is the inability to handle objects recognized. Serial sections showed that the connecting fibres between the external geniculate body and the calcarine cortex on each side were unbroken. The case differs from the ordinary case in that the calcarine cortex and optic radiations were preserved. Softening of the angular gyri and the parts adjacent, in which it is believed the higher visual centres lie, produced such marked disturbance of vision that it was a question much of the time whether the patient had any power of visual perception. The case seems to show, according to Holden, that extreme disturbance of vision may be produced by lesions in the higher cortical visual centres alone.

**Hemiplegia.** An excellent clinical study of hemiplegia, based on 160 cases, has been made by T. H. Weisenburg.<sup>2</sup> Hereditary tendency to hemiplegia, probably by disease of the bloodvessels, was shown in 14 cases; in one family there were 10 cases. In 17 cases pains of various character occurred before the onset of the hemiplegia. In seven instances the pain was described as violent, shooting, or cutting; in 2 as a dull, aching feeling, and in 5 as a tingling, tired, numb, or a pins-and-needle sensation. In all these cases the pains occurred on the side of the subsequent paralysis. The pains were felt mostly from twenty-four to forty-eight hours before, or else just before the onset of the paralysis. In 5 of the cases the pains ceased after the onset of the hemiplegia. Twenty-seven patients had distinct posthemiplegic, sharp, shooting pain, 12 had dif-

<sup>1</sup> American Journal of the Medical Sciences, May, 1905, p. 782.

<sup>2</sup> Journal of the American Medical Association, February 25, 1905, p. 603.



ferent forms of paræsthesia, and 70 complained of soreness in the muscles and joints of the paralyzed side.

The respiratory movements of hemiplegics are said to be of greater amplitude on the paralyzed side in automatic breathing, but of greater amplitude on the sound side in forced breathing (Hughlings Jackson). Weisenburg believes that in automatic expiration the chest on the sound side has a longer range of movement; that is, it retracts more than does the chest on the paralyzed side. This means that the amount of air expelled from the lung on the sound side is greater, that there is more residual air at the end of expiration in the lung of the paralyzed side, and that the movement of the lung is actually weaker on the affected side.

Weisenburg reports extensive œdema occurring in hemiplegia in the paralyzed limbs; also postapoplectic involuntary movements and arthropathies. Atrophy of some degree he has found in every case.

The paper is so full of original observations and ideas that I would recommend it to anyone interested in the study of hemiplegia.

**URÆMIC HEMIPLEGIA.** It has always been difficult to explain why the paralysis of uræmia is so often unilateral, and the view has been advanced by some that a lesion of the motor area had occurred previously, but had not been sufficient to cause persistent hemiplegia; when uræmia developed later, however, the œdema of the brain and toxic cerebrospinal fluid produced symptoms by means of this latent lesion. Some clinical cases are reported by Castaigne and Ferrand,<sup>1</sup> in which a paralysis that had once been present reappeared under the influence of uræmia. Experiments on animals have produced similar results; for example, salt solution injected into the brain of living rabbits has produced transitory hemiplegia, and after intravenous injection of urine or after double nephrectomy the hemiplegia has reappeared. As a theory this is excellent, the only objection to it is that gross lesions of the brain have not been found in many cases of uræmic hemiplegia. Castaigne and Ferrand try to answer this objection by suggesting that the lesion preceding the uræmia may be one or more of the small areas of cerebral softening (lacunes) described by Marie and later by Ferrand. Doubtless there is much truth in this explanation, but it will not explain all cases, as shown by the important investigations of Weisenburg.

**CEREBRAL HEMORRHAGE.** The slow development of symptoms of pressure from hemorrhage on the brain is occasionally seen. W. C. Krauss,<sup>2</sup> for example, reports a case in which pain in the head and vomiting occurred some hours after a fall from a trolley car. Disturbance of speech was noticed about sixty hours after the injury, and Jacksonian epilepsy on the fourth day. A small localized hemorrhage of the cerebral

<sup>1</sup> *Semaine médicale*, June 29, 1904, p. 201.

<sup>2</sup> *American Journal of the Medical Sciences*, September, 1904, p. 393.

membranes had developed on the side of the head opposite to where the blow had been received; this hemorrhage was slowly progressive, and extended backward and downward. The vessel injured was probably a small vein of the pia. The clot was removed at an operation, and the patient recovered entirely within a few weeks.

**SENSORY DISTURBANCES IN HEMIPLEGIA.** In a case reported by Karl Schaffer,<sup>1</sup> in which the right frontal lobe and motor area were seriously affected by a syphilitic lesion, tactile sensation was completely lost in the fingers of the opposite hand, and impairment became less distinct as parts of the limb nearer to the trunk were examined. The same was true of the deep sensation (presumably sense of position is meant) and of stereognostic perception. Schaffer believes this case shows that disturbances of sensation may be caused by a lesion of the motor zone, as the parietal lobe was intact. It appears from the reading of his paper that he includes the postcentral convolution in the motor zone, nevertheless, it is striking that a lesion of this part could cause so grave disturbances of sensation.

**THE DIRECTION OF TURNING IN HEMIPLEGIA.** Leonard J. Kidd,<sup>2</sup> after observing hundreds of cases of organic hemiplegia and spastic paraplegia, has found that in fully 99 per cent. the patient spontaneously turned to the spastic or more spastic side when told to walk to the end of the room, turn around, and come back. He has never seen a functional hemiplegic turn around to the affected side. He concludes: 1. If a spastic hemiplegic or a spastic paraplegic turns around in walking to the affected or the more affected side an organic lesion is present. 2. If he turns to the sound or less affected side the case is either one of functional or of organic affection. If the latter, there will be no difficulty in deciding in its favor by a careful physical examination. Some observations made by R. Pemberton<sup>3</sup> show that the direction of turning in hemiplegia is unreliable.

**ASSOCIATED MOVEMENTS.** An extraordinary form of associated movement is called by W. G. Huet<sup>4</sup> heterotopic innervation. A workman presented peculiar contractions of the trapezius muscle when he spoke. The contractions were seen in the portion of the muscle attached to the third, fourth, and fifth cervical spines. When the man began to speak, a bundle of muscle fibres, 5 cm. in width, became prominent and remained so while he was speaking. The contractions disappeared during every pause in speaking, and seemed to change in intensity according to the variations in the voice. They were observed during singing, and faintly during swallowing, but not during whispering.

<sup>1</sup> *Neurologisches Centralblatt*, November 16, 1904, No. 22, p. 1026.

<sup>2</sup> *Review of Neurology and Psychiatry*, November, 1904, No. 11, vol. ii. p. 742.

<sup>3</sup> *Journal of the American Medical Association*, June 17, 1905.

<sup>4</sup> *Neurologisches Centralblatt*, December 1, 1904, No. 23, p. 1085.

Huet suggests that nerve fibres arising in the vagus nucleus may have passed into the accessorius nerve and through its external branch to the trapezius muscle instead of to the larynx. Such an explanation seems reasonable for this extraordinary form of associated movement.

**COLLATERAL HEMIPLEGIA.** By collateral paralysis is meant a paralysis the result of a cerebral lesion on the same side as the paralysis. Such a condition is exceedingly uncommon and the diagnosis is extremely difficult. J. H. Pringle reports a case which he regards as one of this variety. The patient, a man, was brought to the hospital in coma and with a deep depression of the occipital bone. The right limbs were slightly rigid, the left were not, and when he was stimulated by pinching or pricking he at once moved the left limbs, but never moved the right limbs. He was never seen to make any spontaneous movement of any limb. Pringle made a diagnosis of hemorrhage in the left cerebral hemisphere, and regarded the depression in the skull as a long-standing fracture. At the necropsy a fissure fracture was found, commencing just anterior to the right parietal eminence, running downward and forward, and bifurcating into two limbs. One of these ended in the middle fossa at the sphenoidal fissure; the other in the anterior fossa in the orbital roof. There was no extradural hemorrhage, no hemorrhage over the left hemisphere, and no laceration of that side of the brain; but there was extensive laceration of the right frontal and temporosphenoidal lobes, with a large effusion of blood in the right, middle, and anterior fossæ, which extended well upward over the surface of the right cerebral hemisphere. No hemorrhage was found in the substance of the brain anywhere. Examination of the medulla oblongata did not show any obvious abnormality of the decussation. A microscopic examination does not appear to have been made.

Pringle<sup>1</sup> refers to a few similar cases and to the theories advanced in explanation of collateral hemiplegia. It was suggested by Morgagni that there may be an absence of the usual decussation of the pyramidal tracts, and the observations of Flechsig have given some support to this theory. A few cases of failure in the motor decussation are on record. It is true, as Pringle remarks, and this I have observed many times, that a patient may die who has manifested all the signs of a typical hemiplegia, and yet in the brain after death no lesion is found to account for the symptoms. I would add that no diagnosis of collateral hemiplegia can be accepted unless a thorough microscopic study of the central nervous system has been made, and that I have often seen lesions in the brain so small that they could not be detected with the naked eye. A small lesion within, and not a large hemorrhage upon, the brain may be the real cause of the hemiplegia. Cruveilhier has suggested that blood effused on one

<sup>1</sup> Scottish Medical and Surgical Journal, 1904, vol. xv. p. 394

side of the brain might cause so much pressure of the opposite hemisphere against the skull as to produce paralysis. The explanation is of questionable value. This collateral paralysis is important chiefly from a surgical standpoint, because where it exists an operation is very likely to be done on the wrong side of the head. Pringle suggests that where the hemorrhage is not found, an opening should be made on the other side of the head, but this is a serious undertaking when the patient is suffering from a head injury.

Dupré and Camus<sup>1</sup> report one of the rare cases of homolateral collateral hemiplegia. The motor decussation was incomplete and asymmetrical. The patient had double hemiplegia, the paralysis of one side dated from childhood, the paralysis of the other side of recent date.

**SLOWLY DEVELOPING HEMIPLEGIA.** Williamson<sup>2</sup> believes that hemiplegia of very gradual onset, where the loss of power becomes more marked day by day or week by week, is an almost certain sign of brain tumor, even in the absence of optic neuritis, headache, or vomiting. It may take weeks or a few months before the paralysis is complete. In such cases cerebral abscess must be thought of, especially if there are indications of suppurative disease in any part of the body. Williamson reports 3 cases in support of his statements, and in all 3 cases optic neuritis was absent. The hemiplegia of cerebral tumor is not invariably of gradual onset. In rare cases it is of rapid onset, especially when there is a hemorrhage around or within the growth. Hemiplegia of the gradual onset referred to does not occur in cerebral hemorrhage, embolism, or thrombosis, and there is no single sign, according to Williamson, of greater value in the diagnosis of brain tumor. Weeks at least are necessary for the development of the hemiplegia in order that the sign may be valuable.

**HEMIPLEGIA FROM LESIONS OF THE THALAMUS.** Thomas and Chiray<sup>3</sup> think that a lesion of the optic thalamus may be diagnosed when a hemiplegia at first intense diminishes, while sensory disturbances remain very marked and choreiform or athetotic movements appear in the paretic limbs. The sensory symptoms are persistent and pain is felt in the face and limbs of the anæsthetic side. The anæsthesia is unilateral and is more intense in the distal ends of the limbs.

Usually a lesion confined to the optic thalamus does not cause persistent hemiplegia, although it may cause hemiplegia at the time the lesion first develops. There are exceptions to this rule, and one such is reported by Dejerine and Thomas.<sup>4</sup> Hemiplegia persisted eight years

<sup>1</sup> *Revue neurologique*, March 30, 1905, No. 6, p. 322.

<sup>2</sup> *Practitioner*, July to December, 1904, p. 321.

<sup>3</sup> *Revue neurologique*, May 30, 1904, No. 10, p. 505.

<sup>4</sup> *Ibid.*, July 15, 1904, p. 655.

in one of their cases, and yet there seems to have been no lesion of the pyramidal tract. A large part of the occipital lobe was softened and the thalamus was partly destroyed. This case is of special importance, because it was studied by microscopic sections. A satisfactory explanation for the paralysis is not given by the authors.

**TREATMENT OF HEMIPLEGIA.** Surgical treatment may be of some advantage in cases of partial hemiplegia. Usually the flexors of the upper limbs are stronger than the extensors. If in a case where the extensors are so weak that the flexors have little action, because of the slight resistance from the antagonistic muscles, nerve transplantation is performed, the power may be more equally distributed. It seems reasonable that we should attempt to side-track the excessive flexor power of partially paralyzed muscles, and to convert a part of it into extensor power. This mode of treatment promises to be of more service in cases of early developing hemiplegia than in those where the paralysis develops late. In athetosis the strength of the flexors in the upper limbs is often excessive, and the resistance to passive movement may be very great. Frazier and I<sup>1</sup> have studied a case of this kind, and the improvement produced by nerve transplantation is remarkable. Although only a few weeks have elapsed since the operation, the boy has more voluntary power, though less involuntary power, than he ever had in his life. His upper limbs were worse than useless, and it was quite an undertaking to dress him. He is now able to make voluntary movements of flexion and extension in the hand and forearm of the operated limb in a way he has never done before. This case has been successful even at the present time. Later a similar operation will be performed upon the upper limb of the other side.

**Myasthenia Gravis.** In a study of myasthenia gravis, made by W. Sterling,<sup>2</sup> the duration of the disease in 1 case was about twenty-three weeks. The shortest duration of a case, two to three weeks, has been reported by Widalé-Marcheses. The age of one of Sterling's patients was fifteen years. The youngest person afflicted with this disease was four and a half years old (Goldflam). Another of Sterling's patients was in better condition toward the evening than in the morning; this was especially true of the speech. Usually in myasthenia gravis the fatigue is more marked toward evening. In still another case, the only weakness observed was in the levator palpebræ superioris muscles. A similar case has been observed by Posey and myself. Sterling's patient had had the ptosis of varying intensity eleven years.

Cases of myasthenia gravis with muscular atrophy have been regarded by Oppenheim as atypical examples of this disease or as types of some

<sup>1</sup> Journal of Nervous and Mental Disease, May, 1905, p. 310.

<sup>2</sup> Monatschrift für Psychiatrie und Neurologie, vol. xvi. p. 165.

other affection. This view is not shared by Pel,<sup>1</sup> who reports a case of myasthenia gravis with atrophy of the tongue.

In rare cases the weakness in myasthenia gravis may be confined to the ocular muscles. About 6 records of cases of this kind have been made. Recently two more papers have appeared. The symptoms in the case reported by Spiller and Buckman<sup>2</sup> were: rapid exhaustion of the levator palpebræ superioris of each side, partial recovery after rest, varying degree of paralysis of the external muscles of the eyeballs, with integrity of the inner muscles of the eyeballs, and a response of the sternocleidomastoid muscle, suggesting the myasthenic reaction. The patient stated that on arising in the morning the eyes were wide open and the double images were very close together, and at times he had no perceptible diplopia, but as he resumed the duties of the day all the symptoms returned. When he removed his glasses, one side of which had been kept covered, the upper lid of one eye, depending on which eye he had been using last, began to fall, and gradually the upper lid fell until there was complete ptosis. While this was occurring the upper lid of the other eye gradually drooped, until ptosis became complete or nearly complete on this side. When the upper lids had fallen, if he closed his eyes for two or three minutes, he could open them again.

In the case reported by M. Frank,<sup>3</sup> the patient was only ten years of age. Ptosis developed soon after the child arose in the morning. The eyelids could not be closed firmly, the occipitofrontalis was weak, and the external muscles of the eyeballs were affected. This case is especially interesting on account of the age of the patient and the limitation of the weakness, but the inability to tightly close the eyelids and the paresis of the frontalis muscle were not present in the case reported by Spiller and Buckman.

**MYASTHENIA GRAVIS AND GRAVES' DISEASE.** A case showing the occurrence of myasthenia gravis and Graves' disease in the same person is recorded by Richard Meyerstein,<sup>4</sup> and he refers to similar cases in the literature. He points out that the thymus gland plays a part in the pathology of myasthenia gravis. In some cases of Graves' disease the thymus gland has been found persisting and even hypertrophied. Investigations of Svehla and Reinbach seem to show that certain relations exist between the thymus and thyroid glands. In this way Meyerstein would explain the occurrence of myasthenia gravis and Graves' disease in the same case.

**Amaurotic Family Idiocy.** A typical case of this disease has been described by McKee,<sup>5</sup> and the ocular findings in the case have been

<sup>1</sup> Berliner klin. Wochenschrift, August 29, 1904, No. 35, p. 917.

<sup>2</sup> American Journal of the Medical Sciences, April, 1905.

<sup>3</sup> Ibid.

<sup>4</sup> Neurologisches Centralblatt, December 1, 1904, No. 23, p. 1089.

<sup>5</sup> American Journal of the Medical Sciences, January, 1905.

reported by Mary Buchanan. Shumway and Buchanan confirm Holden's view that the essential change in the eyes is degeneration of the ganglion cells of the retina and of the nerve fibres of the optic nerves and tracts. The examination of the brain and cord by me showed widespread and intense degeneration of nerve cells and nerve fibres, and the changes in the nerve cells were like those I have seen in 2 cases that did not belong to amaurotic family idiocy.

### DISEASES OF THE SPINAL CORD.

**Tabes. JUVENILE FORM.** Marburg collected 34 cases of juvenile tabes, but Grinker<sup>1</sup> thinks this number is too large and that 20 would be an approximately correct number of reported genuine cases. He has observed a most extraordinary family. The mother married at eighteen, and had a son of this marriage, who now is thirty-eight years old and perfectly healthy. The first husband died of some acute disease. The woman nearly twelve years later married again, and had been healthy until her second marriage. Her second husband, a first cousin, had contracted syphilis. The first son of this second marriage had juvenile tabes, a second son had paretic dementia, a daughter had cerebral syphilis. The woman never had any premature births, although she had tabes. The first son, when about five years old and until his tenth year, had enuresis nocturna and diurna. After this he had difficulty in emptying the bladder. When he was about eighteen years old he accidentally discovered that his right eye was totally blind, and shortly afterward vision began to fail in the left eye. The diagnosis of tabes was made because of loss of tendon reflexes, ataxia, rigid and unequal pupils, primary progressive optic atrophy, ptosis, lightning pains, bladder disturbances, girdle sensation, and paræsthesia. Grinker finds that syphilis has invariably been present in every case of juvenile tabes. It is noteworthy that the most intellectual of all the children in this syphilitic family had paretic dementia.

Grinker reports another case of precocious tabes, in which the symptoms began when the patient was twenty-two years old.

Williamson<sup>2</sup> has observed 3 cases of juvenile tabes. The first case was as follows: A girl, aged eight years, had signs of early tabes; her father had contracted syphilis and presented the symptoms of advanced tabes; her mother had had four miscarriages. The second case was in a boy, aged thirteen years, who had the signs of early tabes and teeth characteristic of hereditary syphilis (Hutchinson's teeth). The third case was in a girl, aged seventeen years, who had had symptoms and signs of tabes for

<sup>1</sup> Journal of Nervous and Mental Disease, December, 1904, p. 753.

<sup>2</sup> Review of Neurology and Psychiatry, June, 1904, p. 425.

seven years, whose father had had syphilis, and whose mother had had several miscarriages. These cases, like most of the others of juvenile tabes reported in the literature, showed the causal relation of syphilis to tabes.

Hagelstam<sup>1</sup> has collected from the literature 42 cases of tabes or tabes paresis beginning in childhood or youth, and to these he adds 3 cases of his own; 16 of these cases were in males and 29 in females. If 6 cases in which paresis was a complication are excluded, 13 cases were in males and 26 in females. In more than 25 per cent. of the 45 cases tabes, paresis, or cerebral syphilis had occurred in one parent, and in a few cases in both parents. It is certainly striking that tabes in the young seems to be more frequent in females, as the relationship between the sexes is reversed in cases in which tabes begins in adult life. An argument for the syphilitic etiology is found in these relationships, because where syphilis is hereditary females are as likely as males to develop tabes, whereas in later life males are more likely to acquire syphilis.

**OCULAR DISTURBANCES IN TABES.** Bregman<sup>2</sup> has made some interesting observations on the visual disturbances of tabes. The disease of the posterior root fibres is manifested by loss of function as well as by signs of irritation, namely, by anæsthesia associated with pain, but almost nothing of this character regarding the optic nerve has been seen, and there is usually loss of vision without any signs of irritation of the visual fibres. Bregman has found a remark of Gowers which shows that the distinguished English neurologist has paid attention to this subject, for he says that sometimes during the course of optic nerve atrophy lightning-like light sensations occur. Something similar is reported by Alter: A patient with parietic dementia had attacks during which everything appeared green, lasting one to two hours, and then occasionally giving place to total achromatopsia. The objects assumed various shades of green. These attacks were supposed by Alter to be caused by irritation of the occipital lobe, but, as Bregman remarks, they might have been a sign of irritation of the optic nerves. Bregman had a patient with tabes who had optic nerve atrophy. All objects appeared to him green or violet; usually only one color at a time was visible, and usually when he looked at an object it was first green and then violet, although occasionally violet was first seen. When the eyes were closed the colors were still visible. After a time this green-and-violet vision disappeared and then returned only occasionally. The phenomenon was supposed to be the result of irritation of the optic nerves.

The disturbance of convergence and the appearance of nystagmus in

<sup>1</sup> *Deutsche Zeitschrift für Nervenheilkunde*, No. 3, vol. xxvi. p. 268.

<sup>2</sup> *Ibid.*, Nos. 4 to 6, vol. xxvi. p. 525.



tabes are so rare that when they occur one might think of a complication or might doubt the correctness of the diagnosis. Hans Curschmann<sup>1</sup> reports a case which seems to have been one of tabes, possibly passing into parietic dementia, and in which there were slight bilateral abducens paresis and slight horizontal, occasionally rotatory, nystagmus in lateral movements. Most extraordinary was a convergence spasm. Occasionally while one eye was directed outward it would be drawn forcibly into convergence position and would thus remain a few seconds and then return to incomplete abduction. The spasm was more apparent in the right eye. Convergence spasm occurred at times when the patient looked upward or upward and inward.

**EARLY DIAGNOSIS OF TABES.** It is impossible to emphasize too strongly the importance of recognizing tabes in the incipient stages. Occasionally operations have been performed that should never have been permitted. Abner Post<sup>2</sup> reports a case in which a long scar was found on the right side of the abdomen, which, according to the patient, had been made two years previously. He said that at that time he had had abdominal symptoms, of which pain was the most marked, and raised a suspicion of gastric ulcer. Later, this diagnosis was changed to one of appendicitis. The symptoms were somewhat indefinite, but so severe as to demand an exploratory operation. The appendix was found to be normal, but was removed, and the incision was extended so as to allow of the examination of the gall-bladder and its vicinity. Nothing abnormal was found. Paroxysmal pain had continued during two years, and was probably the pain of gastric crises. The man had difficulty in emptying the rectum and bladder, loss of patellar reflexes, and rigidity of the pupils, suggesting tabes, and in addition he had certain disturbances of speech like those of parietic dementia.

*Gastric crises* seldom cause a fatal termination of the disease. That they may do so, however, is shown in the report of a case by L. J. Kidd.<sup>3</sup>

Sudden retention of urine in a girl previously healthy was the first sign observed by Richard Birnbaum<sup>4</sup> in a case of tabes. This occurrence is rare, but not unknown.

**HYPERTONIA AND HYPOTONIA.** The combination of hypertonia with hypotonia is unusual, but is occasionally seen, as in a case reported by Bychowski.<sup>5</sup> His patient was a woman, aged sixty-five years, who had had tabes dorsalis more than thirty years. Hypotonia was very pro-

<sup>1</sup> Neurologisches Centralblatt, January 1, 1905, p. 10; Deutsche med. Wochenschrift, 1904, 2, p. 1081.

<sup>2</sup> Boston Medical and Surgical Journal, September 8, 1904, p. 266.

<sup>3</sup> Lancet, November 5, 1904, p. 1282.

<sup>4</sup> Deutsche med. Wochenschrift, 1904, 2, p. 1572.

<sup>5</sup> Neurologisches Centralblatt, September 1, 1904, p. 786.

nounced in the lower limbs, while hypertonia was present in the upper limbs. There was an association of two groups of symptoms; on one side lancinating pains, inco-ordination, disturbance of sensation, loss of the tendon reflexes, and hypotonia; on the other side rigidity of muscles, mask-like face, typical tremor, and sensation of burning—a combination of the symptoms of tabes with those of *paralysis agitans*. Bychowski has been able to find references to cases somewhat similar to his, but contents himself with giving the clinical notes of his case without entering into a discussion of a possible relation between tabes and *paralysis agitans*.

**TREATMENT OF TABES.** Raymond<sup>1</sup> has found that the pains of tabes almost always disappear after one or more applications of a tube containing a small quantity of *radium*. The tube was placed over the painful points for five to twenty-five minutes. When a tube containing some other substance was substituted no relief from pain was obtained. This is an important result if confirmed by the experience of others.

Gowers,<sup>2</sup> in an interesting lecture on the pains of tabes, refers to the treatment of this condition. Only superficial pains, he thinks, can be relieved by local measures. Chloroform sprinkled on lint with oiled silk over it may give temporary relief. More lasting is the effect of hypodermic injection of cocaine at the upper part of the area in which the pains are felt. A quarter or a third of a grain may be sufficient to quiet the pain for one or two hours, and often to give permanent relief. It is probable, in Gowers' opinion, that some effect would be produced by the electric administration of cocaine. When rubbed into the skin it has hardly any influence on sensation. Voltaic electricity has no influence on the pains, whichever pole is applied. If the positive electrode of a voltaic battery is saturated with a solution of cocaine, 6 or 10 per cent., the sensibility of the skin is abolished to both touch and pain in ten minutes, and after a longer application the effect continues for about twice the time the current has been allowed to pass. No such effect is obtained with the negative electrode. Applications have not much effect on the deeper pains. A deep injection of cocaine has little effect on the severe pains which are in the softer substance of a limb. Where the tissues are less in amount, as in the foot, pains that seem deep and do not cause tenderness of the skin may be stilled in a few minutes by an injection at the upper part of the region to which they are referred. Antifebrin (acetanilid) is the most effective of the coal-tar preparations, Gowers thinks, in quieting pain, but it is the least prescribed. He has not obtained any evidence that it is more dangerous than the other products. Ten grains of acetanilid, he says, are equivalent to fifteen grains of antipyrin.

<sup>1</sup> *Semaine médicale*, July 27, 1904, p. 237.

<sup>2</sup> *British Medical Journal*, January 7, 1905, p. 1.

The effect of any of these coal-tar preparations is greatest when the given quantity is in a single dose, and the relief of pain is greater when the drug is administered at the beginning of an attack than when the pains have become well developed. In some cases of tabetic pain morphine may be required. Gowers has faith in chloride of aluminum, given in doses of 5, 8, or 10 grains, three times a day, and he believes that it lessens the tendency to pain. It is soluble in water. I am sorry to say that in my hands this drug has not been very efficacious. The salicylates and aspirin (salicylacetic acid) Gowers also finds useful. I have employed aspirin internally and mesotan in a 25 per cent. mixture externally with considerable success in various forms of pain.

**Paretic Dementia.** An extraordinary case of paretic dementia is reported by O. Foerster.<sup>1</sup> After typhoid fever a disease of the nervous system developed, which symptomatically was exactly like paretic dementia, and yet complete recovery occurred. The author does not regard the disappearance of the symptoms as an intermission, which is not uncommon in paretic dementia. Since the end of 1900 the man has performed his work and has shown no symptoms of disease. He was last seen in March, 1903, at which time he was able to do examples in arithmetic, had no longer syllable slurring; the tongue showed no tremor; there was no weakness of the facial or hypoglossal nerve, and no tremor of the hands. The author thinks his case is unique.

M. Reichardt,<sup>2</sup> after making a careful study of many cases of paretic dementia, both clinically and pathologically, has found that in every case in which pupillary rigidity existed, degeneration was present in the zone between the columns of Goll and Burdach—i. e., in v. Bechterew's intervening zone—and was most distinct in its ventral portion at the second and third cervical segments. In all cases of paretic dementia in which the pupils were normal, a greater or less number of normal fibres were found in the intervening zone. He concludes from these findings that a degeneration in the ventral portion of the intervening zone, especially of the third cervical segment, is the cause of pupillary rigidity.

**Spinal Tumor.** Lesions of the spinal cord other than tumor may cause symptoms so much like those of tumor that a mistake in diagnosis is readily made. In a case reported by Raymond and Cestan<sup>3</sup> a progressive spinal hemiplegia was caused by numerous vascular dilatations of the cervical region of the cord. The patient, a male, was twenty years of age. When seventeen years old pain was felt in the back of the neck, and it radiated into the right upper limb, and the right upper and lower limbs gradually became weak. The face was not affected. The tendon reflexes in

<sup>1</sup> *Monatsschrift für Psychiatrie und Neurologie*, December, 1904, p. 583.

<sup>2</sup> *Archiv für Psychiatrie*, No. 1, vol. xxxix. p. 324.

<sup>3</sup> *Revue neurologique*, May 30, 1904, No. 10, p. 457.

the right lower limb were exaggerated, and Babinski's sign was obtained on this side, but not on the other. The right deltoid, biceps, brachialis anticus, and supinator longus were atrophied, and hyperæsthesia was present in the territory of the cervical plexus and superior part of the brachial plexus. The symptoms gradually increased, and the left side of the body became affected. A diagnosis of cervical myelitis from compression by a tumor was made, and operation was determined upon, when la grippe caused the patient's death. The symptoms had lasted three years. Many dilated vessels were found about and within the spinal cord in the cervical region, and the condition was regarded as one of cirroid aneurysm, a very uncommon lesion of the spinal cord. It is fortunate that operation was not attempted, because merely opening the dura mater might have caused intense and fatal hemorrhage.

**Cysts of the Cord.** Cysts of the vertebral canal are so rare, especially if they are not parasitic in origin, that the report of a case of this character by A. Schmidt<sup>1</sup> is of unusual interest. The cyst seems to have been on the external part of the spinal dura and was 7.5 cm. long and 1.5 to 2 cm. broad. It was removed at operation. The symptoms caused by it were those of spinal tumor. It was not a parasitic cyst and was regarded as a connective-tissue formation. The only case that has a resemblance to it is one reported by Spiller, Musser, and Martin, but in our case the cyst was formed from the pia and not from the dura.

**Carcinoma of the Spine.** It is difficult to understand how removal of the ovaries can have any effect on carcinoma in remote parts of the body. Beatson, of Glasgow, in 1896, reported cases in which this operation caused the disappearance for some time of cancer of the breast. Boyd, in 1900, reported the results in 54 cases, in 19 of which oöphorectomy gave more or less benefit. In some the carcinoma had not returned, although several years had elapsed; in others the duration of the disease was more or less prolonged. Zenner<sup>2</sup> refers to these facts and reports an unusual case. In December, 1897, a carcinoma of the left breast was removed. In November, 1899, a small mass was found in the left axilla. Both ovaries were now removed, in the hope that oöphorectomy would arrest the growth of the carcinoma. The pain began in the fall of 1900, three years after the removal of the breast, and nearly one year after the removal of the ovaries. For a few months the pain was confined to the left lower limb, but later the symptoms of carcinoma of the vertebræ and paraplegia dolorosa developed. The patient died June 6, 1903, and a necropsy was not obtained. Zenner speaks of the long duration of the spinal disease—nearly three years. In all the other cases of carcinoma of the spine he has seen, the duration of the

<sup>1</sup> Deutsche Zeitschrift für Nervenheilkunde, No. 3, vol. xxvi p. 318.

<sup>2</sup> Journal of Nervous and Mental Diseases, January, 1905, p. 33.

process has been only a few months, and this seems to be the general experience. He, therefore, asks whether the long course in his case was caused by removal of the ovaries.

**Lateral Sclerosis.** Strümpell's<sup>1</sup> work on primary degeneration of the pyramidal tracts has extended over many years, and he has made valuable contributions to the subject. In his latest paper he reports 3 cases of this kind with necropsy; in the first there was a primary degeneration of the crossed pyramidal tracts, extending from the lower lumbar to the upper cervical region; the nerve cells and all parts of the peripheral motor segments were normal. The direct pyramidal tracts, the direct cerebellar tracts, and the columns of Goll in the cervical region were slightly degenerated. In only 1 of the 3 cases was there any degeneration of the nerve cells, and in that it was slight.

Strümpell remarks that when spastic spinal paralysis begins in early life the knees are slightly flexed, but when it begins in adult life they are extended; the former condition he attributes to the arrest of development in the muscles most affected—viz., the flexors.

There can be no doubt now that primary symmetrical degeneration of the pyramidal tracts without implication of nerve cells does occur, and the symptoms of this alteration are hypertonia of the muscles, with exaggeration of tendon reflexes of the lower limbs; later there may be paresis, but the rigidity precedes the weakness.

In one group of spastic spinal paralysis are to be placed those cases in which there is a family or hereditary tendency to the disease; males are especially affected; the disease begins between the twentieth and thirtieth years of life; the lower limbs alone are affected and the course is very slow.

In another group are to be placed the cases in which the symptoms begin in childhood, but are acquired after birth and are not from trauma. The mental development may be imperfect.

In another group are the cases in which the symptoms begin in adult life, rigidity is general, and later the peripheral motor neurones are affected; so that the disease becomes closely related to amyotrophic lateral sclerosis. Such cases do not usually occur in families.

In a fourth group is the syphilitic spastic spinal paralysis, and in still another may be placed cases in which the symptoms appear after pregnancy and childbirth.

**Family Form of Spastic Paraplegia.** Newmark<sup>2</sup> gives the later histories of the cases of family spastic paraplegia he reported in 1893, and takes this opportunity for a study of the disease. He shows that the symptoms do not begin at the same age in different members of the same family.

<sup>1</sup> *Deutsche Zeitschrift für Nervenheilkunde*, Nos. 3 and 4, vol. xxvii. p. 291.

<sup>2</sup> *Ibid.*, Nos. 1 and 2, vol. xxvii. p. 1.

Injury or an intercurrent malady may hasten the development of the symptoms, and in milder cases improvement is possible; in other cases progression may occur after a long intermission. The microscopic examination of one of Newmark's cases showed degeneration of the crossed pyramidal tracts and of the posterior columns, although the latter does not appear to have caused clinical manifestations. The family form of spastic paralysis is one of the most remarkable of hereditary diseases. The symptoms are motor, and although disturbances of sensation have been observed in a few cases they have been slight. Implication of the brain does not occur in the typical cases.

**Lead as a Cause of Spastic Paralysis.** It is difficult to understand in what way lead causes spastic spinal paralysis, and the cases with such an etiology must be exceedingly rare. In a case observed by Carl Bechtold,<sup>1</sup> symptoms of chronic lead poisoning and of spastic spinal paralysis were present at the same time, and the lead poisoning was supposed to be the cause of the paralysis. The possibility of this occurrence is recognized by Oppenheim, but the way in which the paralysis is produced is unknown. *Tabes* also has been attributed to lead.

**Poliomyelitis.** The implication of the abdominal muscles in acute anterior poliomyelitis is of much interest, because it is a subject that has not received the attention due to it, and because the diagnosis may be difficult. Indeed, I have had for some time under my care a case which may be one of anterior poliomyelitis confined to the thoracic region, and yet the positive diagnosis in this case is impossible at present. W. B. Cornell<sup>2</sup> remarks that many cases showing participation of the abdominal muscles are overlooked, and that the tendency in the vast majority of cases is to rapid recovery when the muscles are affected. Cornell reports a case in which at first the right leg and left arm were paralyzed after an acute onset, but later these limbs recovered their function. As the child cried and raised the intra-abdominal pressure, the right side of the abdomen ballooned out very markedly. On palpation the muscles could be felt to contract under the hand on the left but not on the right side. In the erect position the conditions were intensified and the left side of the abdomen became quite prominent. The paralyzed muscles were the oblique, the transversalis, and half of the rectus abdominis on the right side. The electric reactions could not be tested, as the child cried every time the current was applied. There was no lordosis, but there was a slight sclerosis in the lumbar region, with a convexity to the right. As rare as the implication of the abdominal muscles in acute anterior poliomyelitis is the paralysis of the facial muscles, but this also occurs.

<sup>1</sup> Münchener med. Wochenschrift, September 13, 1904, No. 37, p. 1648.

<sup>2</sup> Bulletin of the Johns Hopkins Hospital, January, 1905, p. 11.

**PROGRESSIVE SPINAL MUSCULAR ATROPHY.** Chronic poliomyelitis is difficult to separate from progressive atrophy of spinal origin. The disease is rare, and especially when occurring in the family form. Bruining<sup>1</sup> has observed it in father and son. In the former the weakness and atrophy began in the right lower limb near the trunk, and within six months similar symptoms were observed in the shoulders and upper limbs and later in the left lower limb. There were no pains and no paræsthesia. The nerve cells of the anterior horns throughout the spinal cord were degenerated. A necropsy was not obtained in the second case. In both there were progressive paralysis and atrophy of muscles, loss of tendon reflexes, fibrillary twitchings, and reaction of degeneration. Subjective and objective sensations were almost normal, and bladder and rectum were intact. In the son the process began in the muscles of the neck and shoulder.

Occasionally a case of chronic anterior poliomyelitis with necropsy is reported, showing that the disease should be regarded as distinct from amyotrophic lateral sclerosis. Such a case is that recorded by Aoyama.<sup>2</sup> One cannot be quite certain, after reading the description of the findings in this case, that the pyramidal tracts were normal, because the Marchi stain seems to have shown degeneration throughout the white matter in the spinal cord. The nerve cells of the anterior horns were much degenerated.

**TREATMENT OF ANTERIOR POLIOMYELITIS.** The cases in which paralysis persists in a group of muscles, or, better still, in only one muscle, may be benefited by the transplantation of the nerves of the diseased muscles into healthy nerves in the neighborhood. In a case observed by Young and myself much improvement was obtained in the paralysis, and in another reported by Frazier and myself<sup>3</sup> the improvement was not so distinct. The method of operation has been described in connection with these reports.

**Multiple Sclerosis.** Oppenheim has observed 2 cases of *syringomyelia* associated with cervical ribs, and now Hugo Levi<sup>4</sup> reports a case of multiple sclerosis associated with cervical ribs. It would seem that both these nervous diseases and the cervical ribs are congenital anomalies.

**Hæmatomyelia.** Taniguchi<sup>5</sup> remarks that no one seems to have observed tubular hemorrhage of the spinal cord as a result of tumor. Leyden and Goldscheider have mentioned the possibility of such a cause, but have not offered the proof, nor have they referred to the occurrence of a car-

<sup>1</sup> Deutsche Zeitschrift für Nervenheilkunde, Nos. 3 and 4, vol. xxvii. p. 269.

<sup>2</sup> Ibid., Nos. 4 to 6, vol. xxvi. p. 375.

<sup>3</sup> Journal of the American Medical Association, January 21, 1905.

<sup>4</sup> Neurologisches Centralblatt, November 1, 1904, No. 21, p. 988.

<sup>5</sup> Deutsche Zeitschrift für Nervenheilkunde, Nos. 1 and 2, vol. xxvii. p. 148.

cinoma in the spinal cord. Taniguchi has had a case in which metastasis in the lumbar region of the cord occurred from bronchial carcinoma, and the small spinal tumor was the source of an extensive tubular hemorrhage. The spinal tumor was not secondary to vertebral carcinoma.

It would be almost impossible to make a correct diagnosis during the life of the patient in such a case as Taniguchi describes. In most cases of hæmatomyelia trauma is the cause, and the diagnosis is not so difficult, but I have tried to show that the clinical diagnosis between traumatic hæmatomyelia and traumatic myelitis is almost an impossible one.

**Combined Sclerosis.** Combined sclerosis of the spinal cord resulting from senility has not received much attention. In a case reported by Wilson and Crouzon<sup>1</sup> the clinical study was very imperfect. There was a combined sclerosis of the posterior and lateral columns of the cord. The sclerosis in the lateral columns extended from the lumbar region to the medulla oblongata, and had its maximum intensity in the upper thoracic region. In the posterior columns the sclerosis was found in the inferior thoracic segments, and increased as higher levels were studied, and could be traced to the medulla oblongata. The sclerosis appeared to be systematized, on the one hand occupying the pyramidal zones throughout, scarcely reaching the periphery, except over a small section of the cord; on the other, being confined to the columns of Goll and to the ventral zone of the posterior columns. Combined senile sclerosis, especially the systematized form, is worthy of more attention than it has received.

**Early Development of Syphilis of the Nervous System.** According to Sicard and Roussy,<sup>2</sup> syphilis of the nervous system occurring soon after infection has been reported by Dieulafoy and others, but there is no mention in these observations of the symptom-complex of diffuse acute meningitis. The symptoms are those of arterial obliteration, and the microscopic examination has shown vascular lesions more or less localized to the large branches from the circle of Willis. Sicard and Roussy report a case in which nervous symptoms appeared about three months after syphilitic infection, and later syphilitic cerebrospinal meningitis was found.

**Abscess of the Spinal Cord.** It is extraordinary that Turner and Collier<sup>3</sup> should have been able to report 3 cases of abscess of the spinal cord, because the condition is so rare that few neurologists have an opportunity to see a single case. In their first case the local necrotic lesion resulted from the pressure of a new-growth of carcinomatous nature; in their second case it resulted from tuberculous pachymeningitis associated with

<sup>1</sup> Review of Neurology and Psychiatry, June, 1904, p. 431.

<sup>2</sup> Revue neurologique, May 30, 1904, p. 491.

<sup>3</sup> Brain, Summer, 1904, vol. xxvii. p. 199.



spinal caries, and in their third case from the pressure of extrathecal tuberculous matter associated with old spinal caries. In all 3 cases suppuration, commencing doubtless in a necrotic region of limited extent, spread in the length of the spinal cord far above and below the area of original damage.

**Myelitis.** Disturbances of urination are common in myelitis and other diseases of the spinal cord. Frankl-Hochwart and Fröhlich<sup>1</sup> seem to have shown that the first act in urination consists in relaxation of the sphincter of the bladder and not in the overcoming of the sphincter by the contraction of the detrusor. Experiments by which the detrusor was placed out of function showed that urination could be produced by electric irritation of the cerebral cortex, and in this way by relaxation of the sphincter of the bladder. These are important observations, because they seem to show that in lesions of the spinal cord or brain the disturbance in micturition may depend upon a lesion of the fibres controlling the action of the sphincter, as well as on a lesion of the fibres innervating the detrusor.

**Reflex Paraplegia.** A peculiar form of reflex disturbance is described by Urbantschitsch.<sup>2</sup> He thinks that paralysis or paresis of the upper and lower extremities, disorders of writing and of speech, of tactile and temperature sensation, and asthenopia may be caused by affections of the sensory nerves of the head, especially of those of the ear. Cocainization of the affected sensory areas of the head may diminish the symptoms, and cure of the aural disease may remove them. An explanation of the manner in which middle-ear disease produces paralysis of limbs reflexly is not given. It appears from the description of the illustrative cases that Urbantschitsch does not regard these symptoms as signs of a neurosis. The paper is so extraordinary that judgment cannot be passed until the subject has been studied by others and some explanation for the phenomena offered.

**Landry's Paralysis.** There seemed to be some relation between cystitis and acute ascending paralysis in the 3 cases reported by T. J. Walker.<sup>3</sup> All 3 patients had had chronic cystitis; in the first and third cases death occurred eighteen hours after the onset of the paralysis of the limbs, and in the second case forty-eight hours after the onset of the paralysis. Each of these 3 cases was distinguished by the sudden invasion of the paralysis, by its very rapid progress, and by its occurrence as the fatal termination of a chronic cystitis. No necropsy was obtained. The explanation Walker offers for the association of cystitis with Landry's paralysis is that micro-organisms were present in the urinary organs, probably in the bladder, and at a certain stage in the cystitis were conveyed along the

<sup>1</sup> *Neurologisches Centralblatt*, July 16, 1901, p. 646.

<sup>2</sup> *Deutsche Zeitschrift für Nervenheilkunde*, No. 3, vol. xxvi. p. 199.

<sup>3</sup> *Lancet*, March 11, 1905, p. 636.

nerves to the spinal cord, where they developed rapidly and produced a virulent intoxication. The weakening of the tissues by the long-standing cystitis predisposed to the paralysis. These cases seem to belong to the class known as "urinary paraplegia," but we are a long way from a satisfactory understanding of the condition. "Urinary paraplegia" has been recognized since the time of Stanley (1833), but there is need for much work on the subject.

**Vertebral Caries.** E. W. Taylor<sup>1</sup> has reported the careful study of a case of tuberculous caries of the vertebræ developing rapidly in a man aged forty-five years. The spinal canal at the necropsy was found free from tuberculous deposits, and Taylor believes that bony compression of the cord accounted in a measure for the pronounced symptoms. A further cause he believed was to be found in the high degree of pathological changes within the cord, these being of the character of vascular alteration with oedema, although oedema at the late stage when the cord was studied was not distinct. In the absence of extradural and intradural tuberculosis, no other explanation appeared reasonable to Taylor, unless some toxin was supposed to have been active. This patient improved under treatment, as do so many others with caries of the vertebræ. Taylor does not believe in laminectomy for cases such as his. If the disease is in an early stage operation is unnecessary, and if in a late stage it is unavailing. I may add that I have known operation to be distinctly harmful. I had the opportunity a few years ago to observe a case in which operation had caused loss of control of the bladder and rectum and loss of sensation in the lower limbs. The man had been paralyzed and extension had not been of benefit, but until he was operated upon he had controlled the rectal and vesical sphincters and had had sensation in his lower limbs.

Taylor's case is one of the few which show that pressure may be caused by displaced bone in caries of the vertebræ. Usually the pressure is from external spinal pachymeningitis.

**Injury of the Spinal Column.** Atrophy of symmetrical muscles from injury of the spinal cord, when the atrophy is confined to only one or two muscles in each limb, is an uncommon finding. Albert Knapp<sup>2</sup> has observed a case in which pressure upon the back caused bilateral wasting of the calf muscles. The patient immediately following the accident had great weakness of both lower limbs and difficulty in passing urine and feces. Atrophy of the calf muscles was associated with stocking form of hyperæsthesia for all forms of sensation in both feet and in the lower part of the legs. The gait was not much impaired when the patient came under Knapp's observation. A similar case does not seem to have been

<sup>1</sup> Boston Medical and Surgical Journal, December 1, 1904, p. 595.

<sup>2</sup> Monatsschrift für Psychiatrie und Neurologie, vol. xvi. p. 161.

put on record. Knapp thinks compression of the spinal cord could not have caused the symptoms, because of absence of paralysis in the muscles of the feet and of absence of spasticity at the ankles; neither is it likely that there was a circumscribed lesion of the anterior horns of the spinal cord. The explanation offered is that during the bending of the trunk forward by the pressure upon the back, spinal nerves were stretched in their passage through the intervertebral foramina. Although the atrophy of the calf muscles had lasted about twenty years, the gait was very little disturbed, because the deeper muscles on the back of the legs had hypertrophied.

**Spinal Localization.** In a previous paper I have attempted to prove that the sensory zone in which the umbilicus lies represents the border between the ninth and tenth thoracic segments of the spinal cord, but from a recent study in association with T. H. Weisenburg,<sup>1</sup> it has seemed more probable that the umbilicus lies within the ninth thoracic sensory zone rather than on its lower border. This determination is important in cases in which operation on the spinal cord is needed, because if anæsthesia extends from below upward to about one inch below the umbilicus we may conclude that the tenth thoracic segment of the spinal cord is seriously injured, while the ninth is not.

### DISEASES OF THE PERIPHERAL NERVES.

**Neuritis.** The development of multiple neuritis within one or two hours is uncommon, and the name of apoplectiform neuritis has been given to this variety. I have at present a patient in whom the nerves of all the limbs became paralyzed in less than twenty-four hours, but A. Westphal<sup>2</sup> reports a more rapid development than this. A woman afflicted with senile melancholia had double pneumonia; mental symptoms were present, and suddenly complete paralysis of the right upper limb occurred. This paralysis lasted six weeks until the patient's death. There was no reason to attribute it to pressure. The electric reactions were quantitatively diminished, but not qualitatively. Hyperæsthesia and hyperalgesia of the skin of the paralyzed limb were found. The microscopic examination showed parenchymatous neuritis of the right upper limb, more intense in the distal parts. The muscles also were implicated. Fibrinous internal pachymeningitis was found extending from the cervical to the lumbar region, and nerve cells of the anterior horns in various parts of the cord were diseased, but more intensely in the right side of the cervical region. A few other cases of apoplectiform

<sup>1</sup> Review of Neurology and Psychiatry, October, 1904.

<sup>2</sup> Archiv für Psychiatrie, No. 1, vol. xl. p. 64.

neuritis are described in the literature. Hemorrhage compressing the brachial plexus has been the cause occasionally. It has been shown that in cachectic persons the peripheral nerves may be diseased, although in life no symptoms indicative of this had been seen. Westphal believes that in his case senile changes in the nerves, toxic effects of the pneumonia, possibly slight injuries, and overexertion of the right upper limb during delirium explain the neuritis, but the apoplectiform onset is not very easily understood.

It is important to know that the patellar reflex may be lost and that rigidity of the pupil may be present in croupous pneumonia, probably as the result of some toxin.

**Interstitial Hypertrophic Neuritis.** It is singular that Martin Brasch,<sup>1</sup> in reporting two cases of interstitial, hypertrophic, and progressive neuritis of childhood, should show a want of familiarity with the literature of this disease, and should regard his cases as atypical examples of neurotic muscular atrophy, without any reference to the fact that Dejerine and Sottas, and later Dejerine alone, have maintained that the two diseases are distinct. In Brasch's cases the lancinating pains and disturbances of sensation were not so severe as in Dejerine and Sottas' cases, but Brasch also observed the myosis and rigidity of the pupils, the ataxia and Romberg's sign, the kyphoscoliosis, and the enlargement of the peripheral nerves. The interstitial, hypertrophic, and progressive neuritis of childhood resembles neurotic muscular atrophy in the wasting of the distal extremities of the limbs, and yet it presents in addition many of the signs of tabes.

**Gonorrhœal Neuritis.** Cases of multiple neuritis caused by gonorrhœa are not numerous, and it is difficult to prove that the neuritis is a result of gonorrhœa. Ménétrier<sup>2</sup> has had under his observation a patient, a man aged forty-six years, who, while having gonorrhœa, developed paresis and pain in the limbs, especially in the lower limbs, atrophy and objective disturbance of sensation, and impairment of the patellar reflex. He died from bronchopneumonia. The microscopic examination showed degeneration of the peripheral nerves and changes in the nerve cells of the anterior horns of the spinal cord secondary to those of the nerve fibres. There seems to be no doubt that during the time this patient had gonorrhœa he developed multiple neuritis, but the evidence is not fully convincing that the former caused the latter, and yet it probably did.

**Facial Palsy.** Seiffer<sup>3</sup> has observed a case of facial paralysis in which Bell's phenomenon was not as it is usually seen; instead of the eyeballs rolling upward and outward in an attempt to close the eyelids of the

<sup>1</sup> Deutsche Zeitschrift für Nervenheilkunde, No. 3, vol. xxvi. p. 302.

<sup>2</sup> Semaine médicale, June 22, 1904, p. 197.

<sup>3</sup> Berliner klin. Wochenschrift, July 11, 1904, No. 28, p. 770.

paralyzed side, they rolled inward or downward. This was not caused by paralysis of any of the external ocular muscles, because the eyeballs could be moved voluntarily in all directions. Only one or two similar cases seem to have been observed, and an explanation for the phenomenon is not given.

Shumway<sup>1</sup> has observed *optic neuritis* occurring in a case of facial palsy. This is not a common association, and may be the result of rheumatism or of infection or of unknown cause. The optic neuritis is usually of the retrobulbar type, but a decided papillitis may be present. He gives the notes of two cases of facial palsy in which flattening of the face and enophthalmos occurred on the paralyzed side. The flattening of the face might be a result of atrophy of the facial muscles, but the enophthalmos is not easy to explain.

The view is held by some neurologists that the facial nerve supplies fibres to the lacrymal gland and occasionally in facial palsy, as in three cases observed by Scheiber,<sup>2</sup> the secretion of tears on the paralyzed side ceases. Ringing in the ears Scheiber explains as caused by the implication of the acoustic nerve. Some cases seem to show that the trigeminal nerve alone innervates the lacrymal gland; so that the question at present is an open one.

Objective disturbance of sensation in the face observed in facial palsy Scheiber ascribes to the presence of sensory fibres in the nerve.

**Measles as a Cause of Neuritis.** Multiple neuritis may occur after almost any infectious disease and is not uncommon in association with influenza, but Edens<sup>3</sup> has observed a case in which it seemed to be caused by measles. He refers to two cases in which it was caused by *scarlet fever*, and says these are the only reported cases (Egis).

**Neuritis from Cervical Rib.** A cervical rib, as Seiffer<sup>4</sup> points out, may cause mistakes in diagnosis. It may give the symptoms of compression myelitis of the cervical cord from spinal caries, or from vertebral or spinal-cord tumor, or those of syphilitic meningitis of the cervical region, or those of syringomyelia, or those of progressive muscular atrophy, or those of peripheral or plexus neuritis. Muscular atrophy of the thenar and hypothenar eminence may be the only pronounced sign for a long time, and a cervical rib may be unsuspected; whereas, if a correct diagnosis were made, operation might arrest the progress of the atrophy. Symptoms of lesion in the brachial plexus or cervical cord should suggest the possibility of a cervical rib, but a cervical rib usually does not cause symptoms. The x-ray helps greatly in the diagnosis.

<sup>1</sup> Journal of the American Medical Association, February 11, 1905, p. 463.

<sup>2</sup> Deutsche Zeitschrift für Nervenheilkunde, Nos. 1 and 2, vol. xxvii. p. 45.

<sup>3</sup> Berliner klin. Wochenschrift, August 8, 1904, p. 849.

<sup>4</sup> Monatsschrift für Psychiatrie und Neurologie, October, 1904, p. 425.

Seiffer reports an isolated paralysis of the musculocutaneous nerve of the upper limb in a man who was a player on the violoncello. This case seems to make only the third reported, in which there was a true neuritis confined to the musculocutaneous nerve, and, according to Bernhardt, there are but 12 or 14 cases of this form of paralysis known. Usually the cause has been trauma. Because of the intense atrophy of the biceps, Seiffer was able to cause contraction in the outer part of the brachialis anticus with the electric current. This part of the muscle is innervated by the musculospiral nerve. No contraction could be obtained in the inner portion of the brachialis anticus, because here the nerve supply is from the musculocutaneous.

**Mononeuritis.** As examples of sensory mononeuritis, R. Kutner<sup>1</sup> describes a case of paralysis in the distribution of the fifth nerve, another of neuritis of the saphenous major, another of neuritis of the peroneus superficialis, another of paralysis of the acusticus and facialis. The first case is the most interesting. The paralysis came on after exposure to draught. Paræsthesia was felt in the distribution of the left trigeminus, and this area was hyperæsthetic. Pain does not seem to have been felt. The mononeuritis of the lower limbs was caused by alcohol. Both nerves that were affected pass through dense fascia. In one case the neuritis developed three weeks after alcohol had been taken, but the metabolic changes caused by alcohol evidently had persisted. The paralysis of the acusticus and facialis occurred after an attempt at strangulation, and the cause was believed to be hemorrhage from rupture of one of the small vasa auditiva interna. Some cases in the literature justify this diagnosis.

**Peroneal Palsy.** Paralysis of the peroneal nerve supply of each side in a woman caused by difficult labor has been observed by Nonne.<sup>2</sup> The explanation given for this is as follows: the fibres forming the peroneal nerve arise from the fifth and a part of the fourth lumbar roots and lie within the pelvis without protection from muscle.

**Stereognostic Perception.** Loss of stereognostic perception in spinal root territory is not often seen, but Dejerine and Chiray<sup>3</sup> have reported a case of this kind. The objective and subjective disturbances of sensation were confined to the innervation of the eighth cervical and first thoracic roots, and paresis also was especially marked in this region. Stereognostic perception was lost in the ulnar half of the hand, and no object could be recognized when placed on the three last fingers of this hand, but it was recognized at once when put between the thumb and first finger.

<sup>1</sup> Monatsschrift für Psychiatrie und Neurologie, January, 1905, No. 1, p. 29.

<sup>2</sup> Deutsche med. Wochenschrift, 1904, vol. ii. p. 1113.

<sup>3</sup> Revue neurologique, May 30, 1904, No. 10, p. 501.

Dejerine and Gauckler<sup>1</sup> believe they have shown by the study of a clinical case that a small lesion of the crossed pyramidal tract in the cervical region may cause a brachial monoplegia of root type, that is, a paralysis in the upper limb confined to the distribution of a nerve root.

**Charcot-Marie Type of Muscular Atrophy.** The occurrence of *optic atrophy* in the muscular atrophy of the type of Charcot-Marie is rare. Ballet and Rose<sup>2</sup> have observed a case, however, in which both optic nerves were atrophied, and they say they have been able to find only 2 similar cases reported. Alfred Gordon<sup>3</sup> reminds them that they have overlooked a case reported by him.

### MISCELLANEOUS NERVOUS DISEASES.

**Epilepsy.** The statements regarding cures of epilepsy vary greatly. W. A. Turner<sup>4</sup> refers to this fact, and attributes the variations to the greater precision in diagnosis, the later authors excluding from their statistics all cases of epilepsy due to organic disease; to the definition of cure, the interpretation of the different writers differing widely. Many authors do not state their definitions of cure, and often so-called cures are merely long remissions occurring spontaneously or as the result of suitable treatment. Turner has made observations upon 516 cases, having excluded all cases which showed any coexisting complications, such as organic cerebral disease and all cases of idiocy and pronounced imbecility. Cases of so-called idiopathic epilepsy were, as far as possible, obtained; while any transitory amelioration resulting from medicinal or other treatment was checked by fixing the minimum period of observation at two years. Turner finds that sex plays little part in the general prognosis of epilepsy. Rather more males than females show arrest of the seizures, but the females give a greater percentage of confirmed cases. It seems that a larger percentage of women than of men escape the deteriorating influence of epilepsy upon the mind, but that when dementia supervenes and reaches its most pronounced form a somewhat higher percentage of women are affected. The most frequent mental condition in male epileptics seems to be a slight impairment of the memory and a blunting of the higher mental faculties.

Turner thinks there is as great a chance of arrest of epileptic fits in those who have, as in those who have not, a known family history of epilepsy. In those who have a hereditary history the chances as to whether the fits become arrested, improved, or confirmed are in any

<sup>1</sup> *Revue neurologique*, March 30, 1905, No. 6, p. 313.

<sup>2</sup> *Ibid.*, May 30, 1904, No. 10, p. 522.

<sup>3</sup> *Ibid.*, 1904, p. 761.

<sup>4</sup> *Boston Medical and Surgical Journal*, February 16, 1905, p. 179.

given case about equal. As regards general improvement, more is to be expected in those who have no hereditary disposition, while a considerably smaller percentage of confirmed epileptics is to be found among those who have no family predisposition to the disease. A family disposition to epilepsy or insanity exerts to a greater extent a deteriorating influence upon the mental condition of those who subsequently develop epileptic seizures. The general statement may be made that a family tendency to either epilepsy or insanity, though offering no obstacle to the arrest of the seizures in favorable cases, materially increases the likelihood of the disease becoming confirmed and the supervention of dementia.

Turner believes that epilepsy commencing under ten years of age is least favorable for arrest or improvement, and most favorable for the production of confirmed cases. In those in whom the disease commences during the period of puberty is to be found the greatest percentage of arrests and the lowest percentage of confirmed cases. The cases of epilepsy which commence between the twenty-first year and the thirty-fifth show a steady diminution in the percentage of arrests. After thirty-five there is a diminution in the number of confirmed cases, and senile epilepsy is a tractable disorder.

The earlier a case is systematically treated the better the prognosis. There is a greater prospect of arrest or improvement during the first five than during the second five years of the disease. Arrests of the fits may occur, even after a duration of from twenty to thirty years, although this is not the rule.

The longer the interval between the attacks, the greater the chances for arrest or improvement. There is a direct relationship between the frequency of the seizures and the degree of mental impairment. The more frequent the attacks the more common and profound the associated dementia.

The major attacks are more readily influenced by drugs than the minor seizures. The least favorable cases are those of petit mal occurring alone. Mental deterioration is found in association with both types of seizure, but it is less frequent in those cases in which grand mal is the main expression of the disease.

Long remissions may occur under bromide treatment, but the attacks may return after the omission of the drug, after a blow upon the head, childbirth, or an acute inflammatory disease. Turner thinks that long periods of arrest, though, as a rule, indicating a favorable prognosis, are not synonymous with the cure of the disease.

The question of cure is the most interesting one upon which Turner touches. He answers it in general terms in the affirmative. He thinks it is unsafe to regard as cured any case of epilepsy in which the seizures



have been in abeyance for a period of less than nine years after the disease has become satisfactorily established. He has studied 147 cases that had been under observation for at least nine years; in 15 of these the attacks were arrested for nine or more years, giving a percentage of 10.2 cures. In a very small percentage of cases relapse occurs after an arrest of nine years. If any given case of epilepsy is capable of amelioration, a satisfactory response will be apparent within a short time of commencing treatment. Of the series of cases in which the disease was arrested, somewhat over 50 per cent. showed arrest within one year of treatment.

We could wish that Turner had given statistics regarding the methods of treatment of his cases.

**CHOLIN IN EPILEPSY.** Mott and Halliburton have found cholin in the blood and cerebrospinal fluid in cases of disease of the nervous system causing destruction of nervous tissue, especially in general paralysis of the insane and in tabes. They regard it as a product of lecithin, which results from degeneration of the medullary substance. Julius Donath<sup>1</sup> has made further studies on cholin in the cerebrospinal fluid obtained by lumbar puncture. He finds cholin, as a rule, in this fluid obtained from epileptics, and has been able to produce violent convulsions in animals by means of cholin, therefore he concludes that this substance plays an important part in epileptic convulsions. Cholin was present in 15 out of 18 cases of genuine epilepsy, and was found as frequently in cases of genuine, Jacksonian, or syphilitic epilepsy (19 times out of 22 cases) as in cases of organic disease of the central nervous system. Cholin was absent in 2 cases of hysteria, in 3 cases of hysterioepilepsy, and in 2 cases of neurasthenia. Donath found, when he injected cholin into the cerebral cortex, that it produced severe tonic and clonic convulsions, resulting even in paresis, and he believes that the epileptiform attacks in progressive paralysis are caused chiefly by cholin in association with increased irritability of the hyperæmic brain cortex, although other substances may also be of importance.

**FOCAL EPILEPSY.** The Jacksonian form of epilepsy is usually indicative of a circumscribed lesion of the brain, but Leo Müller<sup>2</sup> has collected a number of cases in the literature, and reports some new observations to show that status hemiepilepticus may be a manifestation of idiopathic epilepsy and may cause a fatal termination. In these cases no lesions were found. We must acknowledge the correctness of his views, and yet, in a case in which repeated convulsions occur, always begin in, and are confined to, the same parts, in the absence of nephritis, I should be inclined to suggest operation. I have seen a brain tumor cause only this

<sup>1</sup> Deutsche Zeitschrift für Nervenheilkunde, Nos. 1 and 2, vol. xxvii. p. 71.

<sup>2</sup> Ibid., No. 1, vol. xxviii. p. 31.

symptom, and it was removed by operation with most gratifying results. Status hemiepilepticus idiopathicus does occur, but, on the whole, we shall probably make fewer mistakes by operating in doubtful cases when this condition is present, and thereby may not overlook a tumor of the brain.

**EPILEPSY AND HYSTERIA.** Paul Steffens<sup>1</sup> returns to the position he took in 1899—viz., that hysteria and epilepsy are not essentially different, but that the same disease appears in different form and different intensity. Pupillary rigidity and complete loss of consciousness may occur in the hysterical attack, whereas the reaction of the iris and consciousness may be preserved in the epileptic attack. In the interparoxysmal period of epilepsy temporary and even persisting disturbance of sensation and of the special senses may be observed. These and other arguments are presented to show the intimate relation of hysteria and epilepsy. Naturally these views have been severely criticized, and yet they are not more striking than Kraepelin's association of melancholia with mania.

**NEURONAL IN EPILEPSY.** Peter Rixen,<sup>2</sup> after studying the effect of neuronal in epilepsy, concludes that it quiets the epileptic excitement and is a valuable hypnotic. Usually 1 to 2 grains are sufficient, but when the excitement and motor unrest are greater 3 to 4 grains daily may be needed. Neuronal is valuable for the violent headache following the epileptic attacks and for the nervous disturbances of menstruation. Bad effects have not been observed.

**Myokymia.** Two cases of transitory myokymia, much alike, have been observed by Edsall.<sup>3</sup> The description of the condition in one patient is sufficient for both. There was constant fascicular contraction in the muscles of the feet, legs, thighs, abdomen, hands, and forearms, but they were most pronounced in the muscles of the calf. Contractions appeared synchronously in various portions of the calf muscles and continued with such energy and rapidity that they suggested the movements of a mass of very lively snakes. The movements caused frequent twitching of the fingers like a mild subsultus tendinum, but there was no displacement of the feet or toes. There was slight persistent spasms of the feet and hands resembling mild tetany. The mechanical irritability of the muscles was greatly exaggerated; moderately active palpation would bring on violent and exceedingly painful spasm, during which the muscles would become board-like in hardness. The spasm lasted fifteen or twenty seconds. Even a slight attempt at voluntary use of the muscles of the trunk or of the extremities would often bring on violent spasms, and on

<sup>1</sup> Archiv für Psychiatrie, No. 3, vol. xxxix. p. 1252.

<sup>2</sup> Münchener med. Wochenschrift, November 29, 1904, p. 2138.

<sup>3</sup> American Journal of the Medical Sciences, December, 1904, p. 1003.

attempting to sit up in bed the muscles of the abdomen became very hard. An entirely spontaneous spasm was not observed. Active purgation caused a disappearance of the symptoms in each case within a few hours.

Edsall thinks that the high atmospheric heat (July) or some digestive derangement produced by the heat disturbed the body chemistry in some obscure way. The patient had only a slight elevation of body temperature.

**Chorea.** Flaccid, symmetrical paralysis in one or two muscles occurring in diplegia, especially in the form characterized by choreiform movements, has been observed by Klempner,<sup>1</sup> and must be very uncommon. In one case the rhomboid muscles were paralyzed on each side, but all the other muscles of the body had normal power. The patient, a boy aged seven years, had had choreiform movements about three years. In another case the peroneal supply was paralyzed on each side, and the muscles in this distribution were flaccid. Choreiform movements had appeared at the time the child learned to walk. The explanation for these unusual cases is wanting. Poliomyelitis, neuritis, and residual palsy are unsatisfactory means of explaining the flaccid palsy.

In a case of extreme chorea, in a girl aged fifteen years, M. G. Tull<sup>2</sup> has obtained most gratifying results by the administration hypodermically of  $\frac{1}{40}$  grain of *apomorphine*. A dose of  $\frac{1}{20}$  grain by the mouth every three hours with arsenic was then ordered. At no time was there sign of nausea or vomiting. A steady gradual improvement occurred.

**Hysteria.** One might suppose that when hysteria causes a certain spasmodic movement lasting many years some change in the nerve centres would occur. A case affording an exceptional opportunity for a decision in this matter has been reported by S. Weir Mitchell and myself.<sup>3</sup> Mitchell first published a report of the case in 1876, and since that time the patient has been under his observation and many others. The man had a tremor, rhythmical in character, lasting with short periods of intermission until the time of his death. At one period the spasms were controlled by hypnotism. There could be little doubt that the condition was one of hysteria. I examined the nervous tissues obtained in the case and was unable to find any pathological alterations. Indeed, it would have been extraordinary if they had been found, inasmuch as the spasms had been entirely arrested for a time by means of hypnotism. There have been cases of other diseases with long-persisting involuntary movements and necropsy, such as the paramyoclonus of Friedreich, without distinct lesions. The case that we have reported permits the conclusion that the

<sup>1</sup> Neurologisches Centralblatt, March 16, 1905, No. 6, p. 264.

<sup>2</sup> Proceedings of the Philadelphia County Medical Society, January 31, 1905, p. 69.

<sup>3</sup> Journal of Nervous and Mental Disease, October, 1904, p. 625.

most typical hysteria lasting for years presents no representative organic lesion. It is supposable that more delicate methods may in the future reveal lesions, but in a condition in which symptoms may disappear so rapidly as they do in hysteria it seems improbable that lesions exist.

**HYSTERICAL VOMITING.** A remarkable case of fecal vomiting in a hysterical female patient is reported by F. P. Weber.<sup>1</sup> Formed feces from the large intestine were vomited more than once. At times, when an oil enema was administered, some of the oil reappeared in the vomited matter. An enema colored with methylene blue was administered, and some of the methylene blue appeared in the vomited matter within ten minutes after the administration of the enema. Three laparotomies were performed, and even the stomach was opened and explored, and no abnormal condition was found. Weber refers to similar cases in literature and attempts to explain the condition. Active intestinal antiperistalsis, he thinks, is necessary for the occurrence of fecal vomiting of functional nervous origin, and vomiting of formed feces, in the absence of malingering and gastrocolic fistula, practically occurs only in functional nervous cases.

**HYSTERICAL SPASM.** Hysterical tonic spasm of the neck muscles may resemble very closely organic disease, as Knapp,<sup>2</sup> of Halle, points out, with a report of cases. The presence of hysterical stigmata elsewhere may aid in the diagnosis. A careful study is needed to exclude meningitis, tumor or abscess of the posterior cranial fossa, caries of the vertebræ, occipital neuralgia, rheumatism, and traumatic changes.

A peculiar form of spasm is described by C. Wernicke<sup>3</sup> and called by him cramp neurosis. Any energetic, quick, or unusual movement caused a spasm of the muscles of a greater or less part of the body, and the patient for a time was unable to move. The spasms were not as painful in the limbs as in the trunk, and caused much difficulty in breathing. They did not last more than a few minutes, often caused perspiration, and were followed by a sense of fatigue. Voluntary movements were very slow. The muscles of the head, throat, face, and tongue were never implicated. In other respects the patient seemed to be in good health. When he tried to grasp a hand the muscles of the whole limb and those of the thorax and shoulder were thrown into spasm. Passive movements, if of sufficient extent, caused the spasms. Wernicke says he has never seen a similar case nor found one reported. The condition resembled a little that seen in Thomsen's disease, but it differed from it in being acquired in adult life and in the absence of myotonic reaction. In Thomsen's disease the movements are restrained only when they are

<sup>1</sup> Brain, Summer, 1904, vol. xxvii. p. 170.

<sup>2</sup> Archiv für Psychiatrie, No. 3, vol. xxxix. p. 1263.

<sup>3</sup> Berliner klin. Wochenschrift, October 24, 1903, No. 43.

first attempted, and later the patient can dance, jump, or run, but all this was impossible in Wernicke's case. A cause was not known.

**HYSTERICAL PARALYSIS.** A very uncommon case of hysteria is reported by Leyden.<sup>1</sup> A girl, aged sixteen years, became completely paralyzed in all four limbs shortly after a severe fright. The paralysis was flaccid, and sensation was lost in all the limbs. The muscles of the trunk at first were very weak, and retention of urine was present. Complete restoration of function was obtained rapidly by suggestive treatment. Leyden refers to a number of cases of organic and functional disturbances occurring after fright.

**Raynaud's Disease.** Hugo Strauss,<sup>2</sup> in a paper in which he reports two cases of Raynaud's disease, one with necropsy, states that in his opinion the symptoms of this disease are caused by spasms of the vessels, that they may be unilateral or bilateral, seldom are strictly symmetrical, and that therefore the name of "symmetrical gangrene" is not wisely chosen. He prefers to speak of angiospastic gangrene. The gangrene is the final result of malnutrition of the tissue and is produced by the spastic ischemia or the spastic cyanosis, although in the latter condition autointoxication from the products of metabolism assist in causing the gangrene. Raynaud's disease is not a trophoneurosis, in his opinion, but an angioneurosis, and may occur independently or with other diseases of the nervous system.

**Acromegaly.** The cause of acromegaly is unknown. Disease of the pituitary body has been supposed to stand in etiological relation, but, as has been shown repeatedly and recently by Kollarits,<sup>3</sup> a lesion of the pituitary body may exist without producing the symptoms of acromegaly. Kollarits has collected the reports of a number of such cases, and adds two of his own.

**Facial Hemiatrophy.** The progressive atrophy of one side of the face is difficult to understand. In the case reported by Loeb and Wiesel,<sup>4</sup> a woman, aged twenty-seven years, had trigeminal neuralgia soon followed by facial hemiatrophy. The symptoms began in the early part of the puerperium. Degeneration of the corresponding Gasserian ganglion and its peripheral branches was found, but not of the portion of the trigeminus central to the ganglion. The sympathetic did not appear to be diseased.

**Graves' Disease.** Jellinek<sup>5</sup> has observed brown pigmentation of the eyelids, especially of the upper, as an early sign of Graves' disease. It

<sup>1</sup> Berliner klin. Wochenschrift, February 20, 1905, p. 193.

<sup>2</sup> Archiv für Psychiatrie, No. 1, vol. xxxix. p. 109.

<sup>3</sup> Deutsche Zeitschrift für Nervenheilkunde, No. 1, vol. xxviii. p. 88.

<sup>4</sup> Ibid., Nos. 5 and 6, vol. xxvii. p. 355.

<sup>5</sup> Semaine médicale, November 30, 1904, p. 391.

does not extend above the eyebrows. The pigmentation may become less intense in course of time, but rarely disappears.

Sainton and Pisante<sup>1</sup> report much benefit in cases of Graves' disease from the administration of the blood and serum of sheep from which the thyroid gland had been removed. All the symptoms seem to diminish under the treatment. The ingestion is preferable to the subcutaneous injection and the serum more active than the blood. They give 5 to 10 drops as an average dose.

**Paralysis Agitans.** L. Bruns<sup>2</sup> has noticed increased flow of saliva in five cases of paralysis agitans, and it was not caused by any tremor of the jaw. Eight times he has observed tremor in the distribution of the facial nerve, usually in the chin. He has seen bulbar or pseudobulbar symptoms in paralysis agitans—viz., difficulty in swallowing and chewing and in the movements of the lips, tongue, and soft palate. In 3 cases he has seen excessive sweating, and in 2 cases atrophy of the interossei muscles, probably arthritic in origin. He has seen thickening of the fingers, such as occurs in acromegaly. In 7 cases severe pain was felt, usually as an early symptom. He points out that the diagnosis between multiple sclerosis and paralysis agitans may be difficult; indeed, the two diseases may be associated, just as tabes and paralysis agitans may be associated.

Now, the *parathyroid glands* are regarded as the source of many diseases that were thought to have some relation to the thyroid gland. The parathyroid glands were discovered by Sandström in 1880, but they received little attention until Gley, in 1891, showed that tetany could be produced in rabbits, provided the parathyroid glands as well as the thyroid gland were extirpated. Previously it had been supposed that tetany could not be produced in rabbits. In man the parathyroid glands are near the thyroid gland. H. Lundborg<sup>3</sup> reviews the literature on these glands, and shows that convulsions in children, tetany, certain cases of epilepsy, and eclampsia have been attributed to insufficiency of the parathyroid glands. Graves' disease also has been supposed to be dependent upon an abnormal condition of these glands, but Lundborg believes that the condition of the thyroid gland is more important in this relation. He thinks congenital myotonia and paralysis agitans may be dependent on imperfect development of the parathyroid glands, and that myasthenia gravis is the result of overfunction of these glands. Interesting as all this theorizing is, it must be stated the proof is wanting in Lundborg's paper.

<sup>1</sup> Revue neurologique, November 30, 1904, p. 119.

<sup>2</sup> Neurologisches Centralblatt, November 1, 1904, p. 978.

<sup>3</sup> Deutsche Zeitschrift für Nervenheilkunde, Nos. 3 and 4, vol. xxvii. p. 217.

**Muscular Dystrophy.** Babinski<sup>1</sup> has observed true muscular hypertrophy of the right upper limb following *typhoid fever*. He explains this in the following manner: During the typhoid fever myositis occurred, probably as a result of a vascular lesion, this caused marked alteration of the striated substance and paralysis; reparation followed and was excessive in certain muscles, and caused the formation of abnormally large muscle fibres.

A few cases in the literature show that the diagnosis between the muscular atrophy of spinal origin and the progressive muscular dystrophy may be extremely difficult. Dejerine and Thomas<sup>2</sup> have reported a case in which the muscular atrophy was confined to the distal parts of the upper limbs, and fibrillary tremors were seen. The condition had existed thirty-one years. At first the course was rapid, then was arrested, and finally became again progressive. Such a case as this might be well regarded as of spinal origin, but a microscopic examination showed that the nerves and spinal cord were normal.

<sup>1</sup> Revue neurologique, December 30, 1904, p. 1181.

<sup>2</sup> Ibid., p. 1187.





# OBSTETRICS.

BY RICHARD C. NORRIS, M.D.

## PREGNANCY.

**The Heart and Circulation in Pregnancy.** The recognized importance in recent years of the varied manifestations and pathological potentialities of the toxæmia of pregnancy have induced a few observers to review our knowledge of the cardiovascular changes induced by pregnancy. The relations of toxæmia—mild and grave—to the heart and circulation in pregnancy, and especially when cardiac disease antedates pregnancy, offer an interesting field for original work. I have reported a few cases of fulminating toxæmia with violent cardiovascular symptoms, conditions which must be very rare. The less apparent and more insidious relations between vascular changes and kidney and liver functions induced by a mild toxæmia are worthy of careful study.

Nicholson<sup>2</sup> states that the study of the influence of normal pregnancy upon the maternal cardiovascular system has been pursued at intervals since 1825, when Larcher began his investigations in the Paris Maternity Hospital. He made 130 autopsies on women, the greater number of whom had died of puerperal fever, no lesion having preceded or given rise to the condition of the heart found in them. He did not weigh or measure the hearts, but seems to have merely formed the impression that the walls of the left ventricle were considerably thickened by at least from one-fourth to one-third; that the muscle structure was more firm, and the color more bright. He thought that the right auricle and ventricle retained their normal thickness. Comparing his observations with the figures given by Laennec for the normal heart, he assumed that the heart became markedly hypertrophied in pregnancy.

Later, his conclusions seemed to receive confirmation from the work carried out by Ducrest, who measured the hearts of 100 puerperal women and found even his minimum greater than Bizot's figures for the normal heart. Since then many investigators have added important contributions to the scientific study of this question. Yet the question whether the heart does or does not undergo hypertrophy during pregnancy is far from being definitely settled. Unfortunately the evidence

<sup>1</sup> American Journal of Obstetrics, 1903, No. 1, vol. xlviii.

<sup>2</sup> Journal of Obstetrics and Gynecology of the British Empire, January, 1905.]

derived from the standard methods of weighing and measuring the heart, its walls and cavities, and also from the results of physical examination of the organ, is unreliable. With regard to the physical examination of the heart in pregnancy, it is evident that an increase in the cardiac dulness with displacement of the apex beat cannot be accepted as proof that hypertrophy has occurred. Recently Stengel and Stanton have made a study of the heart in and after pregnancy and have thrown fresh light upon this matter. Their observations were entirely clinical and consisted of physical examinations before and after labor, with determinations of blood pressure and sphygmograms. Their study was very complete and painstaking, and their conclusion was that there is no hypertrophy of the left ventricle nor any special increase in its work during pregnancy. The increase in dulness toward the left is, in their opinion, explained by the fact that the diaphragm is lifted up, consequently the heart is displaced in an upward and outward direction. The comparative outlines showed that there is a rapid return to the normal position of the cardiac dulness after labor. They also noted frequently an increase in the extension of dulness toward the left in the second and third interspaces, in which area marked pulsation was often present. A systolic murmur was also sometimes heard over this area, and the lung substance did not seem to be displaced; their conclusion was that this state of things can be explained by a distention of the conus arteriosus and root of the pulmonary artery. They believe that during the latter months of pregnancy some continuous dilatation of the right ventricle does occur, and ascribe it to the upward displacement of the diaphragm and to pressure upon the lungs increasing the difficulties of the pulmonary circulation. Notwithstanding that many are not convinced that the left ventricle undergoes hypertrophy during pregnancy, Nicholson thinks that the evidence, both anatomical and clinical, is in favor of some hypertrophy. The extent to which it occurs is dependent upon a great variety of factors. Considering that in the course of a few months of pregnancy the uterine muscle undergoes enormous hypertrophy, and there is also greatly increased growth of glandular structures of the body, he believes it would be somewhat remarkable if the heart did not likewise pass through an hypertrophic evolution. It is known that the uterine functions are intimately connected with the organs of circulation, as is instanced by certain disturbances of the heart arising sympathetically from morbid conditions of the uterus. And if we bear in mind the well-established relationship between disease of the kidneys and hypertrophy of the left ventricle, there is suggested the question whether certain renal disorders dependent on pregnancy—quite apart from the so-called “pregnancy kidney”—may not exert some direct influence upon the heart. When Bright’s

disease develops during pregnancy, the cardiovascular changes associated with it are well marked; but apart from actual disease the strain of pregnancy falls chiefly upon the kidneys, and, perhaps, their temporary failure in function is a factor that calls forth a certain amount of cardiac hypertrophy.

A heart which has undergone hypertrophy should be able to perform additional work without overstrain. Certain established facts, however, seem to point to a distinct inefficiency. In these cases, although the rate and character of the radial pulse often point strongly to the fact that the left ventricle is endowed with increased activity, one cannot consider the hypertrophy compensatory in the sense that the woman is enabled to exert herself with the same freedom she possessed before pregnancy. Mackenzie has clearly shown that quite early in pregnancy the cavities of the right heart dilate. Nicholson has previously called attention to this paradoxical state of affairs in connection with the heart of pregnancy—a slow, full, radial pulse, quite consistent with a left ventricular hypertrophy, in combination with a large pulsation in the jugular veins, giving infallible evidence of dilatation of the right side of the heart.

In trying to determine the cause of this condition of circulatory phenomena, he cites the argument advanced by Allbutt in support of the toxic theory of puerperal albuminuria. He suggests that in pregnancy there is retained in the system some material which causes a widespread constriction of the arterioles. It is pointed out that in the toxæmia of lead poisoning extreme vasoconstriction occurs, and that many of the symptoms of this condition are remarkably similar to those which develop when the chronic renal disease of pregnancy is present and pre-eclamptic symptoms make their appearance. This theory would provide a reasonable explanation of the circulatory changes referred to, especially if the alterations thereby brought about in the systemic circulation should tend to produce an engorgement of the pulmonary vessels, and, hence, a great increase of venous pressure. This view would seem to make it clear why the left ventricle should undergo some hypertrophy and also to explain the significance of the dilatation of the right heart. The origin of this constrictor substance is not known, but it is supposed that it may, like lead, be introduced into the body from without. In whatever way it gains entrance into the blood it seems to act upon the arteries and arterioles, and probably upon the heart, in a manner very similar to suprarenal extract, or to digitalis in toxic doses. Recent experimental work on the action of adrenalin upon the vascular system lends support to the view that the suprarenal secretion itself is the vasoconstricting principle, and that for some obscure reason it exerts an exaggerated influence upon the cardiovascular system in pregnancy. This work also throws additional light upon some of the hitherto inexplicable circulatory

phenomena—dilatation of the right heart, overfilling of the veins, tendency to œdema of the lungs—which have been observed to occur at the very commencement of pregnancy, long before the addition of the placental circulation to the field of work supplied by the maternal heart can possibly act as a cause. It is possible that these observations may give the clue to the mode of production of some of the well-known phenomena associated with the renal diseases of pregnancy, and may even help to solve the riddle of puerperal eclampsia itself.

Brodie has shown that the effect of adrenalin upon the pulmonary blood pressure is to raise it to nearly double its original value, this rise commencing with and lasting longer than the rise in aortic pressure.

These effects he believes are mainly due to the action of the peripheral bloodvessels in causing the large rise in aortic pressure.

The adrenalin apparently acts upon the bloodvessels through the vasomotor nervous system, as an injection of the drug directly into the systemic vessels caused an immediate contraction, amounting almost to complete closure; while, on the other hand, direct injection into the pulmonary vessels resulted in a remarkably increased rate of flow—an exactly opposite effect. The conclusion from this result is that there are no vasoconstrictor fibres to the pulmonary vessels.

Drummond has studied, histologically, the changes produced by the injection of adrenalin on the glandular organs of the rabbit. Adrenalin produces great congestion of the viscera. These changes may be partly explained by the alteration in the blood pressure; they are also due to a toxic action of the drug. The most suggestive and important fact is that death is due to an acute œdema of the lungs, which is often accompanied by great congestion of these organs. Drummond ascribes these inflammatory changes in the lungs to the toxic influence of adrenalin. This influence is most distinctly seen in the liver and kidneys; upon these organs adrenalin seems to act as a protoplasmic poison. The changes in the liver cells are very similar to those which have been described in other toxic conditions, such as eclampsia. All these points are highly suggestive in relation to the maternal circulation in pregnancy, and also to the toxæmia which sometimes accompanies this state. The toxic influence of the active principle of the suprarenal secretion, while causing constriction of all the systemic arteries and arterioles, acts in exactly the opposite manner upon the pulmonary vessels, with the result that they tend to become engorged with blood. Under its action the whole venous system becomes overfilled and the cavities of the right heart become dilated.

Mackenzie has noted the following series of changes affecting the circulation, which, though in one sense abnormal, may in another sense be considered as incidental to the pregnant state. (1) A limitation of

the field of cardiac response, generally shown by shortness of breath or attacks of palpitation on such exertion as the individual was wont to perform with the greatest comfort. It may be observed from the earliest period of pregnancy and long before the bulk of the uterine contents calls for an appreciably increased supply of blood, or for greater force of the heart's action; that is to say, the heart is not as efficient as before.

2. Changes in the rate and rhythm of the heart: the rate of the heart is frequently increased in early pregnancy, and palpitation follows more readily upon slight exertion. Changes of position, as from lying down to standing up, produce a more marked increase in the pulse rate than occurs in the non-pregnant state.

3. Dilatation of the right side of the heart: the increase of cardiac dulness is partly explained by the fact that the heart is pushed upward, but it is also due to dilatation of the cavities of the right auricle and ventricle.

4. Tendency to œdema of the lungs: as the pulmonary circulation is maintained chiefly by the right ventricle aided by the respiratory movements, the diminished expansion of the chest in the later months of pregnancy tends to make it more difficult for the ventricle to force the blood through the lungs. When the patient lies for several hours with the ribs pressed against the bed so that little movement of the chest is possible, the respiration is carried on mainly in the upper part of the chest, and is more shallow. On this account the blood is apt to become stagnant at the bases, and if we examine a pregnant woman toward the end of term we shall find, at the bases of the lung behind, on the side upon which she lay, numerous fine crepitations with the first deep inspiration. These crepitations constitute the first sign of the beginning of œdema of the lungs. The crepitations may disappear in the first instance after a deep inspiration, later they do not disappear, and frequently the conditions gradually advance until there are dulness on percussion and absence of breath sounds, and at postmortem examination the lungs are found engorged and sodden with dark blood. In normal pregnancy the condition rarely goes beyond the first stage, but the author insists upon it as another sign of the nature of the circulatory changes caused by pregnancy.

5. Tendency to overfilling of the veins of the leg: mechanical pressure will not serve to explain the various venous engorgements which occur in pregnancy, and which can sometimes be demonstrated very shortly after conception. The circulatory changes and vasomotor phenomena already discussed point strongly to the view that some powerful constrictor of the arterioles is responsible for the rise of pressure in the veins.

6. The occurrence of marked pulsation in the veins of the neck:

Mackenzie regards it not as an abnormal sign, but merely as evidence that the right side of the heart is dilated. Clinically this is the most important of all the symptoms that arise in connection with the circulation in pregnancy, for from its study we are able to recognize certain changes that take place in the right side of the heart. As a means of interpreting certain changes in the heart's action during pregnancy, in relation to the question of prognosis where mitral disease is present, this symptom of venous pulsation is of the greatest value. The venous pulse as it occurs in normal pregnant women is best observed in the recumbent position. As a rule, the pulsation is confined to the internal jugular vein, and as the carotid artery beats in the same situation the pulse in the vein is often mistaken for the beating of the carotid. The first part of the venous pulse, due to the systole of the auricle, occurs earlier than the carotid pulse; the collapse of the veins is synchronous with the arterial pulse. Mackenzie has framed the following rules as a result of his investigations of the various phenomena arising out of the dilatation of the right side of the heart. It is his belief that they form some sure ground upon which the practitioner may base his treatment.

1. When there is distinct evidence of failure of compensation, as evidenced by dropsy, enlarged liver, etc., or when the patient is liable to frequent attacks of failure of compensation, pregnancy should be forbidden.

2. With fair compensation, if there should be paralysis of the auricle, as evidenced by the presence of a diastolic murmur and the absence of a presystolic murmur, or of a continued irregularity of the pulse, or of a jugular pulse of the ventricular type, pregnancy should be forbidden.

3. With fair compensation, with a mitral murmur systolic or presystolic in time, with the apex beat within the nipple line, and due to the left ventricle, the patient may undertake the burden of pregnancy.

Patients having valvular disease should be kept under close observation after conception has occurred. The presence or absence of oedema of the lungs is an important prognostic symptom.

**The Blood in Pregnancy.** Although the subject of the constitution of the blood during pregnancy has been given a great deal of attention and investigation, the results attained even by the more modern methods have not been uniform. This fact has led Thompson<sup>1</sup> to endeavor to clear away some of the doubtful points. His observations were made upon 12 patients, and each patient was examined once a month from the time she came under observation; 2 cases came under observation at the second month, 2 at the third, 4 at the fourth, 3 at the fifth, 1 at the sixth. The women were all of the poor class, but were living

<sup>1</sup> Johns Hopkins Hospital Bulletin, June, 1904.

under practically the same hygienic and dietary conditions. They had no constitutional disease or special pathological affection. Four of the cases were followed throughout their pregnancy and subsequent delivery, while the remaining cases are still under observation. The monthly examination of each case included (1) enumeration of red blood corpuscles, (2) estimation of the percentage of hæmoglobin, (3) count of leukocytes, (4) differentiation of leukocytes, (5) determination of the specific gravity of the total blood content. The series comprises 33 separate blood examinations, each examination including 5 parts, or a total of 165 various estimations.

**CONCLUSIONS.** (1) A moderate decrease is observed in red-blood corpuscles rather early in pregnancy, remaining subnormal throughout the middle month to rise again to normal at the end of pregnancy. This, however, is not true in all cases. (2) There is a low percentage of hæmoglobin which is constant throughout the first seven months and rapidly approaches normal as pregnancy draws to a close. (3) A slight absolute leukocytosis exists in every case of pregnancy, but this slight leukocytosis does not support the theory that it is due to any positive chemotaxis. (4) There is no variation from normal in the different forms of colorless corpuscles, the leukocytosis affecting all forms of white cells alike. (5) The specific gravity is high at the outset of pregnancy, diminishing by progressive steps, to reach its lowest level in the middle months, and rising to normal at term.

**Venous Dilatations in the Gravid Uterus and Their Clinical Importance.** Great dilatation of the bloodvessels of the pregnant uterus is so rare that only a few cases have been found in the literature on the subject. Kaufmann has reported two cases. The present case is reported by Halban.<sup>1</sup> The patient, aged twenty-six years, was in her first pregnancy; she menstruated last May 3, 1903. At the beginning of June a slightly blood-stained discharge appeared. It lasted for eight days and afterward became purulent. During this time the patient had pains in the back and breasts, and a slight rise of temperature. Severe hemorrhages developed later and she was admitted to the hospital July 26th. Upon examination she appeared to be pregnant about three months. With rest in bed the bleeding soon ceased and she was allowed to leave the hospital. She was readmitted later with severe hemorrhages, when it was decided to empty the uterus. The cervix was dilated under ether anæsthesia with Hegar's dilator and the embryo and membranes were removed with ovum forceps. It was discovered that in the operation a small piece of the uterine wall was brought away in the bite of the forceps; a careful examination revealed a perforation of the uterus about

<sup>1</sup> Monats. f. Geburts. und Gynäkol., Bd. xx., Heft 3.

three fingers' breadth above the internal os. The uterus was accordingly removed per vaginam and three serious lesions were found, two in the cervix and the one above mentioned. Recovery was uneventful. On cutting open the uterus along the anterior wall the musculature presented the appearance of a sponge on account of the great dilatation of thin-walled vessels varying in size from a pin's head to that of a pea, with the muscle wall between them as thin as paper. These vessels were evidently veins and capillaries greatly dilated, whose walls almost touched one another on account of the great thinning out of the muscle substance between. The outer and inner groups of vessels seemed to be most affected. Kaufmann's cases occurred, one in a thirty-year-old primipara, and the other in a widow of forty-one, non-pregnant.

Three explanations seem to offer themselves in these cases: One, that it is a nævoid formation in a non-pregnant uterus, in the same way that angioma occurs in the liver. Secondly, venous dilatations of the non-pregnant uterus from back pressure. This was apparently the explanation in the second case reported by Kaufmann. Thirdly, varicosities in the pregnant uterus from hypertrophy of the veins, as in Kaufmann's first case and in the present case.

The author believes that a specific change in the vessels due to pregnancy is the cause of this curious condition, and that varicosities result from thinning of the vessel walls instead of hypertrophy. The varicose veins of the vulva, legs, and abdomen, so often seen in pregnancy may be caused in this way, too, for they cannot be explained on the pressure hypothesis. The dangers in the case are the great liability to hemorrhage, and also the liability to laceration if any operative procedure has to be undertaken. Both of these possibilities were exemplified in the present case.

**Hyperemesis Gravidarum.** The investigations and discussions of the subject of the excessive vomiting of pregnancy have not yet made the etiology of the disease clear. In this connection a review of several papers upon this subject which have appeared<sup>1</sup> will prove interesting. Graefe discusses Boehm's theory as to its causation, namely, the *syncytial intoxication* theory. This view is that the simple vomiting of pregnancy becomes excessive from the third to the fifth month, because at this period there is a considerable degeneration of chorionic villi, which take no part in the formation of the placenta, and that as a result of this degeneration the syncytial remnants enter the blood stream and there exert a toxic effect. This intoxication produces a species of immunity in the patient which leads Boehm to suggest that this is the explanation of the fact that multiparous women are not so likely to suffer from excessive vomiting.

<sup>1</sup> Monats. f. Geburts. und Gynäkol., July, 1904, Bd. xx., Heft 1.



Three categories of cases can be noted, however, in which Boehm agrees that this view will not hold: (1) those in which vomiting begins in the second half of pregnancy; (2) those in which vomiting continues after abortion; (3) those in which the vomiting ceases after abortion and in which the patients die. In the first and second groups the author suggests diseases of the brain, kidneys, liver, alimentary canal, etc., as causes of the vomiting. In those cases of the third group which die, he believes death to be due to such a large amount of cell destruction by the syncytial toxin that recovery is impossible. Two cases reported by Pick have a direct bearing upon this statement: one died of a septic endometritis after abortion, and the other of a diphtheritic endometritis. In such cases only a postmortem examination can reveal the true cause of death, and it is probable that the excessive vomiting had nothing to do with the death in either of these cases. Another cause of vomiting may be the retention of conception products, where, after abortion, the vomiting does not cease until the retained tissues have been removed. The author is not convinced by Boehm's views, and asks: If one believes that hysteria may be a real cause of excessive vomiting of pregnancy, how could a purely psychical mode of treatment cure it if a syncytial intoxication were the cause? Kaltenbach, who is the great exponent of the view that *hysteria* is the prime cause of excessive vomiting, assumes that hysteria is a true functional neurosis, which, by increasing the reflex excitability of the vomiting centre, causes hyperemesis. And, further, that the cure of hyperemesis by psychical or physical treatment is brought about in the same way as the cure of an hysterical paralysis or contracture.

If the usual stigmata of hysteria be present the diagnosis is easy, but hysteria may be present even if they are not found. The author agrees with Kaltenbach, and he places great importance upon the fact that many primagravida have read of excessive vomiting, and that an unwelcome conception may really be the underlying cause of a functional neurosis. Numerous cases are quoted as upholding this theory, among them the two above mentioned which ended fatally, and the one in which the removal of placental remains was followed by cure. This latter case the author believes favors Kaltenbach's view, for this reason: the patient still believed herself pregnant after her incomplete abortion, and it was not until she was convinced by the removal of placental remains that she was no longer pregnant that the vomiting ceased. The removal of the placental remains acted by suggestion and not as by the removal of a toxic substance. The other cases were treated by rest in bed, milk diet, and removal from friends.

Zaborsky discusses hyperemesis from other points of view and distinguishes those cases which have some obvious lesion of the generative

or other tract which could reflexly cause vomiting, and those in which apparently no lesion of any kind exists. No special hypothesis is necessary to explain hyperemesis when lesions exist, for a pregnant woman has simple vomiting as a general rule, and any existing lesion will make it worse. Where no obvious lesion exists the views of Fischel, Lindeman, Dirmoser, Clivio, and Boehm may be considered with advantage. All these writers, with the exception of Boehm, regard hyperemesis as a manifestation of autointoxication, either miasmatic or having its origin in the alimentary canal. Dirmoser takes this view for several reasons: (1) the appearance is that of a serious disease with great weakness, rising pulse, fever and jaundice; (2) urinary analysis gives evidence of decomposition of bowel contents, such as indol, skatol, albumin, and kidney elements; (3) the postmortem appearances are those of parenchymatous degeneration of liver, kidneys, etc., such as is found in other conditions of toxæmia. Zaborsky, however, believes that it is just as simple to explain these cases as reflex vomiting from the pressure of scybala or a distended bladder on the uterus, and that the washing out of the tract as recommended by Dirmoses and others cures the case by removing pressure. Hence, he does not believe that the majority, at all events, are cases of autointoxication. Vomiting tends to cease as the uterus rises out of the pelvis; if, however, it does not cease at that time, autointoxication from whatever source may play an important part.

Baisch in his paper considers both hyperemesis and salivation in pregnancy. He reviews the various theories which have been advanced under the headings: (1) obvious diseases of organs leading to excessive vomiting, such as rigidity of cervix, erosion, endometritis, displacements of the uterus, liver, kidney, stomach and blood and brain diseases; (2) intoxication from alimentary canal, from lack of salt in food, and from the developing embryo; (3) reflex neurosis of the stomach starting from uterus or intestine, or an increased reflex irritability; (4) bacterial infection. If the treatment of an obvious lesion cures hyperemesis, then that lesion must be looked upon as the cause, and so the first group may be looked upon as obvious causes. But only a small percentage of the cases fall in this group. Of the other groups the author looks upon the reflex neuroses and reflex increased irritability as the most likely. Two important points must be considered in connection with this theory: (1) that hyperemesis is directly concerned with the embedding of the embryo in the wall of the uterus and ceases when the union thus formed is broken after abortion; (2) the gradual increase of simple vomiting until it becomes excessive. No hard and fast line can be drawn between these two conditions. On these considerations he believes that it must be allowed that the irritation which reflexly causes vomiting must arise from the growing embryo itself. This is

understood when one considers the whole effect of the embryo on the maternal organism—*e. g.*, the growth of breast tissue and the milk secretion. These reflex influences also affect the centres for the digestive organs, as is observed in the ravenous hunger which sometimes is present as a result of pregnancy.

Pregnancy is a physiological condition and most women are able to meet the demands of it; but if there be any insufficiency, the reflex disturbances will produce such an irritation of centres that excessive vomiting perhaps results. As to the nature of the irritation which causes this reflex excitability, we must consider its source in the uterus, its effects on the medullary centres, and its effect on the periphery of the reflex arc, namely, the stomach. From these points, too, the treatment may be established. Artificial abortion is indicated when the uterus is at fault, narcotics and suggestion when the cause lies in the nerve centres, and dietetic measures when the chief failure is in the performance of the stomach functions. The chief difficulty is to decide when abortion should be produced. The danger of putting it off until too late is very great, but if loss of weight, prolonged fever, albuminuria, pulse frequency, diazo reaction, etc., are carefully considered, there should be less difficulty in this direction when diet, suggestion, local treatment of uterus, etc., fail. Excessive salivation in connection with hyperemesis adds to the seriousness of the condition, and there seems little doubt that the same reflex excitability of nerve centres and reflex irritations may give rise to both conditions.<sup>1</sup>

Williams<sup>2</sup> believes that the evidence we have at present justifies us in dividing the cases of serious vomiting of pregnancy into the following groups: (1) reflex; (2) neurotic; (3) toxæmic. Reflex vomiting in pregnancy may occur from abnormalities of the genital tract or ovum which existed prior to the onset of pregnancy or are coincident with it, such as (*a*) displacements of the uterus, particularly retroflexions; (*b*) ovarian tumors; (*c*) certain cases of endometritis; (*d*) abnormalities of the ovum, such as hydatidiform mole, hydramnios, and certain cases of twin pregnancy. The abnormal conditions of the cervix, so frequently mentioned in the literature, should not be considered as factors in the causation of reflex vomiting, since it is probable that the occasional cures following their treatment are only striking examples of the curative effect of suggestion. Many writers have contended that most, if not all, cases of vomiting of pregnancy are neurotic in origin and more or less closely allied to hysteria, and were amenable to suggestive treatment. Williams considers this view too extreme, but nevertheless believes that it holds good for many cases. This variety of vomiting should be diag-

<sup>1</sup> Journal of Obstetrics and Gynecology of the British Empire, August, 1904.

<sup>2</sup> Surgery, Gynecology, and Obstetrics, July, 1905.

nosed only after excluding organic lesions and demonstrating the absence of toxæmia by a most thorough examination of the urine. Toxæmic vomiting was, according to Williams, first suggested by Fischel in 1884. In his case the toxæmic nature of the condition was attributed to the absorption of toxic materials from the impacted large intestine. During the past ten years the toxic theory of the vomiting of pregnancy has commanded a more and more prominent position, and all sorts of theories concerning the origin and nature of the toxic material have been advanced. Among them are (a) secretion of corpus luteum; (b) secretion of ovary; (c) absorption from intestines; (d) hepatotoxæmia (Pinard and Bouffe de St. Blaise); (e) invasion of the maternal organism by fetal elements, the syncytiotoxin theory of Veit, Boehm and others; (f) its identity with eclampsia on the one hand and acute yellow atrophy of the liver on the other (Champetier de Ribes and Bouffe de St. Blaise, Stone, Ewing, and Edgar). From his own experience as well as that of Stone and Ewing, Williams feels no hesitation in saying that in at least a certain proportion of the toxæmic cases of vomiting of pregnancy characteristic lesions may be found at autopsy, and are identical with those observed in acute yellow atrophy and icterus gravis.

These consist in the degeneration and necrosis of the central portions of the liver lobules and the fatty degeneration and necrosis of the secretory portions of the kidneys, and can only be explained on the assumption that some powerfully toxic substance is circulating in the blood. At present we are absolutely ignorant as to the exact nature of this toxic substance or substances, though in the present state of our knowledge it would seem most natural to suppose that they are metabolic in origin and are directly connected with pregnancy, though whether derived from the mother or foetus or both is not known. All that we can state definitely at this time is that in some cases of pernicious vomiting we have to deal with a toxæmia which gives rise to serious lesions in the liver and later in the kidneys, and that the latter are secondary in character, as is indicated by the fact that the urine does not contain albumin until shortly before death. Associated with these lesions is a striking change in metabolism, which is manifested by a marked increase in the percentage of nitrogen put out as ammonia compared with the total nitrogen of the urine, so that the former instead of being 3 to 5 per cent. as normal, may rise to 16, 32, or even 46 per cent., as in several of the cases. The practical outcome of this condition in the writer's experience is that a marked increase in the ammonia coefficient in women suffering from pernicious vomiting indicates the existence of a serious toxæmia, which, if allowed to continue, will be found to be accompanied by lesions of the liver and other organs inconsistent with life.

Under such circumstances abortion should be induced as soon as the

condition is detected, as it offers the only hope of checking the toxæmia and saving the life of the patient. His experience will not justify him in laying down definite rules as to how great an elevation in the ammonia coefficient is consistent with the safe continuance of pregnancy. But until further experience demonstrates to the contrary, it would seem safe to assume that an ammonia coefficient of 10 per cent. represents the danger signal, and immediate interference is demanded as soon as it is reached. In the reflex and neurotic forms of vomiting the ammonia output remains normal, and thus not only affords a means of diagnosis between the neurotic and toxæmic varieties of vomiting, but is a most valuable guide as to treatment.

The writer agrees with Stone and Ewing as to the anatomical lesions found in certain cases of vomiting of pregnancy, but takes sharp issue with them when they contend that the toxæmic vomiting, acute yellow atrophy, and eclampsia are manifestations of one and the same toxæmia. His experience teaches him that there are at least two toxæmias of pregnancy, and probably more—one giving rise to the vomiting of pregnancy and acute yellow atrophy, and the other to eclampsia. In both necrotic lesions occur in the liver, but differ totally in character in the two diseases and need to be seen only once to be appreciated. In eclampsia the lesions begin in the portal spaces and invade the lobule from the periphery toward the centre; while in the vomiting of pregnancy the necrosis begins in the centre of the lobule and spreads peripherally and never involves the portal spaces. In most cases of eclampsia and pre-eclamptic toxæmia there are marked signs of involvement of the kidneys and general circulation—as manifested by scanty urine in proportion to the intake of fluid, the early appearance of pronounced albuminuria, and the presence of casts and œdema.

In vomiting, on the other hand, the urinary output is diminished only as the intake of fluids is interfered with, and albumin and casts are present only in the last days or hours of life, while œdema is absent.

Chemical examination of the urine shows in eclampsia the total amount of nitrogen greatly diminished, while the ammonia coefficient remains practically normal. In vomiting, on the contrary, in spite of the scanty amount of urine, the amount of total nitrogen remains approximately normal, while the ammonia coefficient is wonderfully elevated.

Generally speaking he regards a high ammonia output as a favorable prognostic sign in eclampsia, and a very ominous one in vomiting.

The above discussion indicates the necessity for determining by careful study the type of case one has before beginning treatment. Local pelvic disorders, such as uterine displacements, cervical inflammation, or rectal impaction having been corrected, the gastrointestinal tract routinely should receive treatment, and of all means at our disposal

daily lavage of the colon with two or more quarts of salt solution will be found most valuable. The frequency of fecal concretions and mucous accumulations in this disease are astonishing. Calomel and salines are further aids in elimination. Appropriate diet, and, what is of very great value in the successful handling of these cases, the gaining of moral control of the patient are necessary. Patients with unmistakable hysterical symptoms should always be isolated and subjected to a modified rest treatment in which hydrotherapeutics are profitably employed. A temperature record, repeated examinations of the blood and the vomited material, stomach lavage, critical examinations of the urine, and of the cardiovascular system help to an intelligent decision as to the necessity for terminating pregnancy. Estimation of the ammonia output, according to Williams, should be an efficient guide. Its practical value should be confirmed by further investigation.

**Changes in the Nose and Pharyngeal Space in Pregnant, Parturient, and Lying-in Women.** The recent work on the coexistence of nasal lesions and dysmenorrhœa, and the cure of the latter by the treatment of the former, has led Freund<sup>1</sup> to investigate the condition of the nose and throat in a large number of pregnant women at different periods. From his study of the cases and a careful consideration of the lesions found, he has drawn the following conclusions:

1. There are physiological relations between the female sexual organs and the nose.
2. These relations made themselves clear in pregnant women, for out of 100 women examined 66 had hyperæmia of the pharyngeal mucous membrane and hypertrophy of the turbinated bones, especially the lower, more seldom the middle.
3. The pregnancy changes in the nose are not periodical as has been suggested, but are continuous, and clinically show themselves by epistaxis in 25 per cent. of the cases.
4. These changes are induced especially by the circulatory apparatus.
5. During the labor pains there is a considerable swelling of the turbinated bones, a physiological phenomenon started reflexly by the respiratory organs.
6. The nasal pregnancy disturbances often remain during the puerperium, and suckling has no influence upon them.
7. In certain women reflex hyperæmia gravidarum can be started from the swelling of the turbinated bones and septum, and treatment of them by the galvanocautery cures the vomiting.
8. More seldom the pharynx shows hyperæmia and hypertrophy of the mucous membrane and tonsils during pregnancy.<sup>2</sup>

<sup>1</sup> Monats. f. Geburts. und Gynäkol., Bd. xx., Heft 3.

<sup>2</sup> Journal of Obstetrics and Gynecology of the British Empire, November, 1904.

**Albuminuria and Pregnancy.** The frequency of albuminuria in pregnancy has varied, according to different investigators, from 6 to 50 per cent. The different results obtained are doubtless due to several factors, such as care and accuracy of observation, the character of the test employed, the period of pregnancy, and the race and habits of life of the patients, especially as related to diet, exercise, and constipation. I have long ago discovered in my hospital routine examinations that the frequency of albuminuria falls abruptly after the change in diet and daily administration of laxatives to which all our patients are subjected. In the last 100 consecutive cases at the Preston Retreat, the examinations made at ten-day intervals for each patient albumin has been found, by the nitric acid contact method, in only 8 per cent. of the cases. When albumin is detected, heat and nitric acid are also employed, and for volumetric estimate picric acid with gravity or centrifugation are used. As examples of the different results obtained by two observers, I have placed in contrast the work of Stewart and of Little.

In an attempt to throw further light upon the problems of the relationship of pregnancy and labor to kidney changes and to eclampsia Stewart<sup>1</sup> reports the following cases. In the same publication, No. 21, 1903, the writer reported the results of 442 examinations of the urine of 85 pregnant women as follows:

Month . . . . .	2	3	4	5	6	7	8	9
Number of examinations . . .	9	17	20	43	44	69	71	168
Albumin found . . . . .	0	0	1	0	1	3	1	7
Percentage . . . . .	0	0	5	0	2.3	4.3	1.8	4.1

Albumin was found in 13 cases, or 15.3 per cent. In 72 cases no trace at any time was found, a result of 84.7 per cent. Albumin occurred oftener in the ninth month than in all the others combined, but the difference was only relative, arising from the greater number of examinations. In 11 cases the albumin disappeared, and in 1, in which casts appeared, even these disappeared under medical treatment. Albuminuria persisted in 1 case.

He reports that the characteristic feature of the treatment in these cases is: a simple flushing out of the bowels, and incidentally the kidneys, which restores to the normal what might have proved to be a serious pathological lesion in the pregnant woman. This, he believes, goes a long way in proof of the falsity of the theory that pregnancy produces a persistent and increasing tendency to the production or retention of poisonous materials in the mother's system. This view he believes to be strengthened by the fact that in the cases reported there was no

<sup>1</sup> American Journal of Obstetrics and Diseases of Women, January, 1905.

return of the symptoms after they had been once removed, and particularly by the fact that 84.7 per cent. pregnant women showed no albuminuria. A report of 5 cases treated subsequently to the series discussed above is presented with an analysis. All showed evidences of the nephritis of pregnancy, and in no case was there evidence of a diathesis such as syphilis, rheumatism, malaria, tuberculosis, or chronic Bright's disease.

There was nothing apparent in any of the cases, aside from the pregnancy, to account for the kidney disturbances. In 4 of the cases there was at no time any deviation from the normal as regards the kidneys until within the week preceding the delivery; in 1 the nephritis appeared at the first catheterization after labor; 3 were under the writer's care and 2 under the care of a competent physician for months before delivery. In 4 cases there was, after the appearance of albumin, a marked increase in the quantity thereof and then the appearance of casts, leukocytes, etc., in increasing quantities before delivery, and a very decided increase in all these constituents immediately after confinement. In 2 cases there was marked diminution in the quantity of the urine: twelve and twenty-four ounces, respectively, in twenty-four hours.

The characteristics of Cases II., III., IV., and V. of this second series, is that the treatment which had been so successful in the former series was of no avail in them. The next characteristic of all cases except III. is that the ending of the pregnancy was followed in a relatively short time by a cessation of all threatening symptoms. Another point, in view of the idea that labor itself produces kidney lesions, is that in all cases except I. the symptoms began to appear before labor set in and continued for a variable length of time after labor was ended. In Cases II. and V. labor could have had no possible influence in the production of nephritis, as there was no labor, the woman being delivered by *accouchement forcé*. Case IV. was different from the others in that albumin persisted for months after the delivery. This inclines one to the belief that there was here some permanent lesion and that pregnancy had nothing to do with it. Did the pregnancy, or did it not, cause the kidney troubles? In favor of it speak the occurrence of albuminuria and nephritis during the pregnancy; the prevalent belief among obstetricians that a causal relation exists between the two, and the disappearance of all symptoms in the great majority of cases after the labor had been completed. Against it are the facts that in the great majority of cases (87.4 per cent.) there were absolutely no symptoms which pointed to a change in kidney function; that in the overwhelming majority of cases the albumin disappeared under medical treatment, although the pregnancy was not interfered with; that there was no return of symptoms in any case when once they had disappeared, and particularly in the one case in which even nephritis had shown itself; that in 2 cases, 1



of albuminuria and 1 of [nephritis, the symptoms persisted, in 1 after treatment and in 1 after delivery, leaving in the latter case the strong inference that some other factor had been the cause of the nephritis.

Stewart explains the production of the kidney troubles as follows: He says that the conclusion is not far-fetched that in the cases of simple albuminuria the pressure of the enlarging uterus upon the intestines produced sluggishness in peristalsis and consequent constipation; this in turn caused retention of the products of composition, their subsequent absorption into the general system, and thus additional work was thrown upon the kidneys; the consequent effort upon the part of the kidneys to throw these products out of the system would in time produce hyperæmia of those organs, kidney fag, and, hence, albuminuria. Thus could we also account for the great immunity which exists among pregnant women among the 87.4 per cent. who never showed albuminuria at any time. The processes which result in albuminuria are probably identical with those which produce nephritis. The process means in its simpler stages, simple albuminuria, with restoration to the normal by simply unloading the intestines and the liver; in its severer forms, in those cases in which the intestines are neglected or the digestion is overtaxed, the albuminuria does not yield so readily and the condition is not readily relieved; in the still severer forms hyperæmia becomes more persistent, and then occur red blood corpuscles, leukocytes and casts, nephritis. The pregnant woman, judging from these facts, is no more liable to disease or disturbance of kidney function than the non-pregnant woman. The pregnant woman may have albuminuria or nephritis from causes which would be operative in the other case and which would have no reference to pregnancy. This theory makes the hepatotoxæmias and autotoxæmias secondary factors and removes them from the category of primary or essential causes. A pregnant woman is constantly trying to poison herself, but, as this occurs in every other individual whose intestines do not perform their functions, pregnancy need not be invoked as the principal cause. In contrast with Stewart's observations the careful work of Little<sup>1</sup> is most interesting. He says that the majority of medical men look upon eclampsia as coincident with, if not consequent upon, renal disease, and consider the condition of the urine of the greatest importance in the diagnosis of impending eclampsia. The presence of albumin, however, must be considered of doubtful significance unless two important points are continually kept in mind: First, that the investigations of Ingerslev, Schroeder and Charpentier have conclusively proven that eclampsia may occur independently of the presence of albumin in the urine; and, second, that albuminuria is much more

<sup>1</sup> American Journal of Obstetrics, September, 1904.

frequently present during pregnancy, labor, and the puerperium than is generally supposed; so that deductions made, as to the patient's condition, based on this abnormality alone, are difficult to make and questionable when made.

With the object of ascertaining how frequently albumin is present, an analysis of the urinary records of 967 patients confined in the Johns Hopkins Hospital was made. These records were not uniform, in that each case was not invariably examined before, during, and after labor; so that the results under each of these headings must be considered separately. Voided specimens were examined once a week during pregnancy, usually on the tenth day of the puerperium; a specimen was also obtained by catheterization during or immediately following the third stage of labor. The results are as follows:

TABLE I.

	Pregnancy.			Labor.			Puerperium.		
	Total, 715	I-para, 418	— para, 297	Total, 560	I-para, 341	— para, 219	Total, 538	I-para, 302	— para, 236
Negative . . . . .	49.2	46.9	52.5	37.0	33.7	42.4	43.0	40.0	46.6
Albumin, all cases . .	48.8	51.2	45.5	62.0	66.3	44.3	56.5	59.6	52.5
Casts and albumin . .	10.1	11.5	8.0	18.0	22.0	11.9	11.5	13.9	8.9
Casts, no albumin . .	1.9	2.0	2.0	0.5	.....	1.4	0.5	0.4	0.9

The figures signify percentages except in the uppermost line.

These results differed so markedly from those of other observers that it was decided to make a further careful investigation of 100 consecutive cases, examining both voided urine and that obtained by catheterization, with a view of confirming our previous results or determining where they were in error. Voided specimens were examined weekly during pregnancy, and another specimen the fourteenth day of the puerperium by the registry clerk. Catheterized specimens were obtained once every two weeks during pregnancy, immediately after the third stage of labor and on the tenth day postpartum. The latter were personally examined. By examining both voided and catheterized specimens, it was possible to note whether catheterization had any influence upon the results obtained, as well as how closely the findings of two observers would correspond when working with specimens obtained at different times from the same patient. The presence of albumin was determined by boiling and the addition of a few drops of acetic acid. When in doubt, the nitric acid test was also used. Fehling's solution was used for the sugar tests. It was never found during pregnancy, but a few specimens obtained postpartum gave a typical reaction.

TABLE II.

	Pregnancy.						Labor.			Puerperium.					
	Catheterized.			Voided.			Catheterized.			Catheterized.			Voided.		
	Total.	I-para.	+ para.	Total.	I-para.	+ para.	Total.	I-para.	+ para.	Total.	I-para.	+ para.	Total.	I-para.	+ para.
Totals regularly examined } Negative . . . . .	85	52	33	78	48	25	100	62	38	98	58	35	54	36	18
Albumin, all cases	54	54	54.5	58.5	58	44	10	5	18	62	62	68	44	42	50
Albumin and casts	46	46	46.5	46.5	42	56	89	95	79	31	33	28.5	56	58	50
Casts, no albumin	14	7.8	24	4	...	12	41	45	34	8.6	8.4	9.0	6	6	6
	...	...	...	...	...	...	1	...	2.7	6.5	5	0.9	...	...	...

Comparison of results obtained from the examination of voided urine and that obtained by catheterization. The figures signify percentages save in the upper line.

From this table it will be seen that, considering the albuminuria of pregnancy, in comparison with the results in Table I., there is little material difference. Albumin was found in 48.8 per cent. and 46.5 per cent. of the voided specimens in the two series, respectively, and 46 per cent. with catheterized urine.

Another table of statistics is given showing the results obtained by other observers; these include Ingerslev, Flaischen, Lantos, Fischer, Pajikull, Trantenroth, and Zangmeister. Accurate results in these investigations are obtained by the frequent examination of a moderate number of cases, rather than by the study of a large number in which no regularity is observed. In the table referred to only the work of Lantos, Fischer, and Trantenroth fulfils this condition. Trantenroth found albuminuria during pregnancy in 46 per cent. of primiparæ and 45 per cent. of multiparæ, a result very similar to that of the writer. There is a wide variation in the results obtained by the above-mentioned observers which can readily be explained, since in most cases there was but one examination of the urine and the figures were in great part taken from hospital records, which were probably lacking in uniformity if not in accuracy. The results obtained by Trantenroth and Zangmeister as to the incidence of albumin in the urine immediately after labor are about similar to those arrived at by the writer. The marked increase in the number of casts found in the author's results are ascribed to the great care taken in searching for them. Pajikull found that their frequency varied directly with the speed of his centrifuge and the time of centrifugation. In regard to albuminuria during the puerperium, in both series the results—56 per cent. and 56.5 per cent.—obtained from voided specimens are higher than that given for the catheterized series—31 per cent. This is thought to be due to contamination of the

voided specimens by the lochia and is fairly in accord with the records of Pajikull, who found 32 per cent. and 38 per cent. in his own and hospital cases, respectively. The following deductions are made from the foregoing tables:

1. Albumin is noted in the catheterized specimens of urine from about one-half of all the pregnant women, being equally frequent in primiparæ and multiparæ. On the other hand, albumin is found more frequently in voided specimens from multiparæ. This accords with the investigations of Zangmeister and Trantenroth.

2. Casts (Table II.) apparently occur with greater relative frequency in multiparæ, as noted by Zangmeister.

3. At the time of labor there is a marked increase in the incidence of albumin alone and of albumin associated with casts, the increase in each case being specially marked in primiparæ. This may be due to the muscular work and increase of blood pressure during labor.

4. It is not unusual during pregnancy, labor, and particularly the puerperium, to find casts present without the presence of albumin. While this is in accord with Fischer's observations, it must be borne in mind that the quantity of albumin may have been too small for easy recognition.

5. Albumin and casts are frequently found in the puerperium, but less often than in pregnancy. It is noteworthy that in no case was albumin present during pregnancy and absent at the time of labor, while there were only 3 cases showing casts in pregnancy and not at labor. Two-thirds of the cases showing casts at the time of labor presented albuminuria during pregnancy.

These general facts were noted when considering the series of cases represented in Table I.:

1. In 9 cases of threatened eclampsia and 25 others with definite eclampsia albumin was invariably present. In the latter group casts were present in 22 out of 23 cases examined.

2. A case of hyperemesis gravidarum showed much albumin and many casts. This with another unrecorded case bears out Lindemann's observations as to its toxæmic character.

3. The persistence of albumin and casts during the puerperium was most marked in those cases in which they were noted during pregnancy.

Thus, of 77 cases, 34 showed the condition only at labor; in 19 others not positive before labor it disappeared on the average in 3.5 after labor; while of the remaining 24 cases in which the condition had been noted during pregnancy, 33½ per cent. showed albumin as late as the tenth day.

4. Albuminuria was noted in 4 cases of abortion, 2 of which were due to syphilis and 1 each to typhoid fever and chronic nephritis. In no case was abortion associated with uncomplicated albuminuria.

5. Nausea and vomiting had been noted in 20 per cent. of the primiparæ and 33½ per cent. of the multiparæ, who later showed albuminuria, and œdema was present in one-third of the cases.

6. In 75 per cent. of the cases the first note of the condition was made within the last eight weeks of pregnancy, being most frequent two to four weeks before labor. This figure is possibly due to the fact that a large number of the cases enter the hospital at about this period of pregnancy.

While in an even number of cases it is shown that the percentage of blacks who show casts ten days after labor is greater than the whites, a greater number of the white multiparæ show casts during later pregnancies.

Puerperal infection, or intercurrent disease in the puerperium, appears to influence the duration of the albuminuria. In multiparæ where there was no definite rise of temperature during the puerperium, the duration of the albuminuria postpartum seemed to vary with the time of onset during pregnancy, early incidence being for the most part associated with long duration. In only one case was albumin noted late in the puerperium where not of long duration in pregnancy, and this was after curettage for subinvolution. The time of appearance of albumin during pregnancy varied with the voided and catheterized urine. In the voided specimens in most instances it appeared between the thirty-fifth and fortieth week. In the catheterized specimens it was not noted until about the thirty-eighth week. It was assumed that the regular mode of living, easily digested food, daily movement of the bowels, and more particularly a daily warm bath, had much to do with diverting a large portion of the toxic substances from the kidneys.

The writer was unable to confirm Zangmeister's statements concerning the effect of the duration of labor, either upon the frequency of albumin or its amount when present. It was found that the character of the pelvis had no appreciable effect on the incidence of albuminuria.

The average weight of the children was 3255 gm. (6.5 lbs.), and the whites were invariably heavier than the blacks. The children of white multiparæ are heavier on the average than those of primiparæ, while the reverse is true of the blacks. There was no definite relation between the weight of the children and the renal condition, though other observers have thought that the dystocia resulting from excessive weight of the children predisposed to albuminuria. The average weight of the placenta varied between 16.5 and 17 per cent. of the weight of the corresponding child. The writer was unable to note any definite relation between the grade of albuminuria and the extent of infarction in the placenta, which is not in accord with the well-known association of extensive infarct formation with albuminuria. The relative average age of the patients

bore no relationship to the renal condition. These cases have been divided by von Leyden into two groups—(a) true nephritis; (b) the kidney of pregnancy—the former showing a typical acute parenchymatous change with exudate; the latter a large, pale kidney, apparently the result of a degenerative process which, in some cases, was so pronounced as to suggest the action of a corrosive irritant. Clinically, the two conditions were only to be distinguished by the severity of the symptoms. These cases belong entirely to the latter class. A true nephritis characterized by general symptoms and the presence of blood in the urine is a rare condition, having occurred but once in 1500 cases in the Johns Hopkins Hospital wards. Theories as to the cause of albuminuria in pregnancy may be divided into two classes: theories of mechanical pressure and those based on quantitative or qualitative alteration of the blood. Later observers have for the most part abandoned the pressure theories and sought to explain the condition by changes in the circulating blood, but the question is, as yet, by no means settled. Whether the blood serum of a pregnant woman is more toxic than usual or not, there can be little doubt that the presence of a living fetus is accountable for the presence in the circulation of certain products, causing headache, nausea and vomiting, and even hyperemesis gravidarum, with accompanying changes in many of the abdominal organs.

Eclamptic attacks usually cease with the death of the fetus, and the disappearance of the albuminuria under the same circumstances has been demonstrated.

The fact that the condition of the patient has almost invariably been benefited by stimulation of the excretory organs, other than the kidney, would appear to be the strongest argument in favor of an intoxication; while the whole train of symptoms bears a striking analogy to those induced by other toxins, notably as in scarlet fever. There is no definite proof that the condition of toxæmia is secondary to the kidney condition, and the fact that in some toxæmias other organs than the kidney may show the most marked changes is a definite argument against this contention.

**Eclampsia.** "SPECIFIC" IRRITABILITY OF THE GENERAL NERVOUS SYSTEM IN PREGNANCY. It seems very probable that the nervous system shares in the many changes which take place in the maternal organism during pregnancy. Blumreich speaks of a nervous excitability of a special or "specific" type in the brain of a pregnant as compared with that of a non-pregnant woman. This B. Wolff<sup>1</sup> believes to be of especial significance in the study of eclampsia. He experimented upon pregnant and

<sup>1</sup> *Zentralb. f. Gynäk.*, 1904, No. 26; *Journal of Obstetrics and Gynecology of the British Empire*, August, 1904.

non-pregnant bitches, and observed the time which elapsed before the onset of convulsions after the removal of both kidneys in each group. His conclusion was that the uræmic poison acted with the same degree of intensity in both groups. After employing injections of kreatin Blumreich and Zuntz found the cerebral tissues of pregnant bitches more easily excited than those of bitches which were not pregnant. Blumreich then concluded that the irritability of the brain in pregnancy is "specific" in that it is not excited by all irritants, but only by some. B. Wolff found in his experiments (1) that in those instances in which he removed both kidneys of pregnant bitches the fetus frequently died *in utero* before the onset of uræmic symptoms; (2) that uræmic convulsions after double nephrectomy were quite the exception and not, as Blumreich stated, the rule.

In these experiments the gestation products were found to be macerated at the time of the mother's death; hence the question as to the kind of excitability the mother's nervous system underwent during pregnancy could not be ascertained in this way, since after intrauterine fetal death the animal experimented upon could no longer be considered pregnant in the fullest physiological sense of the term. With regard to the onset of uræmic convulsions after double nephrectomy, Blumreich had experimented upon 28 animals in all, some pregnant, some not; without exception typical, violent, general convulsions occurred in every case. Wolff's results were in complete antagonism to these. In 79 total nephrectomies performed on bitches by him, 41 animals died on the second day and 4 on the third day after operation. In 29 cases sudden death from uræmia occurred, and in only 2 cases were general convulsions noted. Wolff's conclusions were (1) that experiments upon animals seem to make it probable that the central nervous system of women is more easily excited in the gravid than in the non-gravid state; (2) we have not sufficient knowledge to express an opinion of the nature of this irritability, and it is premature to speak of a "specific" cerebral excitability.

THE PATHOLOGICAL ANATOMY AND THE PATHOGENESIS OF THE TOXÆMIA OF PREGNANCY. Ewing<sup>1</sup> has for a number of years past pursued continuously the study of the pathology of the *hepatic toxæmia of pregnancy*, and, while it is not complete, the material points to some definite conclusions which it seems desirable to present. He has demonstrated the hepatic lesions of three clinical manifestations of the toxæmia of pregnancy.

*Eclampsia.* Hemorrhagic hepatitis occurs in practically all typical cases of acute fatal eclampsia at term and in at least 95 per cent. of all cases of any variety of eclampsia, and is pathognomonic of this type of

<sup>1</sup> The American Journal of Obstetrics, February, 1905.

the disease. The liver is usually of normal size, reduced in consistence, while the surface and section present many minute hemorrhagic foci. Microscopically, there is a uniform and intense granular, hydropic, and fatty degeneration of the liver cells, which results in the abolition of their function. Focal necroses and minute hemorrhages are numerous.

*Acute Yellow Atrophy.* Illustrated by a patient aged twenty-one years, pregnant four and a half months. She suffered for two weeks with severe headache, epigastric pain, and vomiting. The vomiting gradually ceased, but the headaches continued and the patient became hysterical. Slight fever, epistaxis, jaundice, and muscular twitchings, with one general convulsion, occurred two hours before death. The urine was free from albumin and casts, but contained leucin and tyrosin. This case falls between eclampsia and acute yellow atrophy; it completely fits neither type of disease, but serves the purpose of illustrating the connection of acute yellow atrophy and eclampsia. The liver was slightly reduced in size and consistence; its section mottled red and yellow. There were complete hydropic and fatty degeneration of the inner two-thirds of the lobules, an intermediate zone of necrotic and disintegrated cells, and a narrow peripheral zone of cells showing slight granular and fatty degeneration.

In the third case the patient had eclampsia with minimal hepatic lesions. Macroscopically the liver was but slightly altered; microscopically it revealed moderate diffuse granular and fatty degeneration, foci of intense degeneration with disorganization of the liver cells, foci of partial necrosis in which the cells show watery contents and pyknotic nuclei, and areas where the cells are distended with bile pigment. These lesions belong to the process of autolysis of the liver cells, which is attended with profound alterations of the function of the organ.

These three cases show that eclampsia may exhibit the hepatic lesions of (1) hemorrhagic hepatitis, or (2) acute yellow atrophy, or (3) no striking gross changes, but only microscopic lesions of the process of autolysis of the liver cells.

Three cases of *pernicious vomiting* are also recorded. The first was a well-nourished patient, aged twenty-six years, who had vomiting in the first three months, which subsided and returned in the eighth month. The vomiting increased in severity for two weeks, accompanied by abdominal pains and mental dulness. There was no jaundice nor convulsions. Coma appeared two days before death. The liver was anæmic in appearance, and typically "nutmeg." Microscopically there were complete necrosis of the inner two-thirds of the lobules, extreme hydropic degeneration of the outer third, with a peripheral zone showing moderate fatty degeneration. The second patient, well nourished, aged thirty-two years, had severe vomiting in previous preg-



nancies. The third pregnancy began with severe vomiting, which subsided in the second month, but again became acute in the eighth month. She was treated as hysterical and the vomiting was controlled two days by moral suasion. She died on the eighth day of the attack, without convulsions or jaundice and after vomiting had nearly ceased.

The liver was very soft, mottled red and yellow. There was intense granular hydropic and fatty degeneration of cells. The cells in the inner half of the lobules were necrotic and nearly disintegrated.

Case III. was that of a woman who had been acting strangely and vomiting repeatedly for a week before being brought to the hospital. Her symptoms were attributed to alcoholism. She was transferred with a diagnosis of hysteria and fibroids, but was found to be pregnant and suffering from toxæmia. The urine contained a faint trace of albumin, leucin, and some casts. There were no fever, jaundice, or convulsions, but death occurred in twenty-four hours. The liver was very soft, congested, and fatty, and the blood remarkably thick and cohesive. There was intense degeneration, granular and hydropic, of the liver cells. The hepatic lesions of these three cases of pernicious vomiting are identical with those just demonstrated in the last two cases of eclampsia. As one of these cases of pernicious vomiting gave a distinctly atrophic liver, the general conclusion must be drawn that the morbid process in eclampsia, acute yellow atrophy, and pernicious vomiting of pregnancy is one and the same. Similar lesions were observed in pregnant animals.

10 c.c. of blood from pernicious vomiting in Case III. was injected into the peritoneal cavity of a rabbit. The animal had muscular spasms after twenty minutes, seemed moribund, but recovered. Five days later it died, the liver being in a state of extreme degeneration, granular, hydropic, and fatty. 10 c.c. of normal human blood injected into the peritoneal cavity of a rabbit rendered the animal restless for about thirty minutes, with no further symptoms.

A case of *acute yellow atrophy* occurring after abortion at two months is also reported. The patient was a poorly nourished woman aged about forty years. She never recovered from the abortion, but suffered from indigestion, vomiting, and abdominal pain. Death occurred on the fourteenth day. The liver was very soft, uniformly deep red, with the lobules obliterated. Microscopically, it showed the late stage of acute yellow atrophy. Two cases of *acute leukæmia* following pregnancy are also reported, both terminating fatally. The lesions in the liver were those of acute yellow atrophy, with extensive necrosis. Two facts seem to connect acute leukæmia and the toxæmia of pregnancy. First, the occurrence of leukæmia shortly after pregnancy, which seems to be too frequent to be explained as a mere coincidence; and, second, the pres-

ence of leucin and tyrosin in the urine, both of leukæmia and of the toxæmia of pregnancy. Other cases suggest that the toxæmia of pregnancy may have an important relation to the severe anæmia which follows parturition, and to bear a fundamental relation to puerperal sepsis.

Ewing believes that the disturbance of nitrogenous metabolism which is responsible for the clinical manifestations of the toxæmia of pregnancy is a failure of oxidizing capacity on the part of the liver. The proteid derivatives, which are normally combined by the liver into urea, are no longer combined, but circulate free in the blood in poisonous form, and are to some extent excreted by the kidneys. Other proteid derivatives, as those containing sulphur, also fail to be oxidized and contribute to the toxæmia.

Large quantities of leucin, tyrosin, and lysin have been found in the blood of acute yellow atrophy. The complex nature of the source of these poisons renders less obscure the fact that the clinical manifestations of the toxæmia of pregnancy vary from mild vomiting to acute yellow atrophy.

Recent study of the toxæmia of pregnancy and of many other clinical conditions furnishes abundant evidence that the morbid process in acute yellow atrophy is of very frequent occurrence and is often followed by recovery. On both clinical and pathological grounds there is just as little reason for separating the mild and fatal cases of vomiting of pregnancy as for denying the identity of mild and severe cases of diabetes.

The urinary changes indicate chiefly deficient oxidation of proteid derivatives. Instead of urea, uric acid, ammonia, leucin, and tyrosin and other unoxidized proteid radicles appear in the urine, and instead of sulphates there are unoxidized sulphur compounds. As leucin, tyrosin, and ammonia are estimated with urea by the hypobromite method, this test is unreliable in following the urinary changes in pregnancy. He believes that the examination for various unoxidized proteid derivatives will prove a fairly reliable indication of the seriousness of the case. It is not sufficient to examine the urinary sediment for leucin and tyrosin, but the urine freed from albumin must be precipitated by basic lead acetate, filtered, the lead removed by a current of hydrogen sulphide, and the filtrate evaporated to a syrup in which characteristic crystals of leucin are identified by the microscope. Albumin and casts are sometimes present, but may be absent in dangerous stages of the disease and even in fatal cases.

The absence of jaundice is characteristic of fatal cases of vomiting of pregnancy which show the hepatic lesions of acute yellow atrophy. In these cases the bile-producing function of the liver is inhibited.

The present view of the toxæmia of pregnancy classes the disease

as a functional disturbance of the liver, usually attended by severe anatomical lesions of this organ and secondarily by functional and anatomical disturbance in the kidneys and other organs. The production of urea is exclusively a function of the liver. While disturbance of the kidneys exists from the first, it only becomes pronounced when poisons resulting from failure of oxidation cause degeneration, congestion, and exudative inflammation in these organs. Hence the disease may be far advanced before albuminuria appears. As the disease is originally a functional disturbance of the liver, we find some cases with minimal lesions of the liver. Of recent theories the part which the thyroid gland plays in connection with the morbid process is worthy of consideration. Two conditions found at the autopsy table were of striking interest. One was the distention of the intestinal tract with saline solution in a subject which had failed to absorb any of the fluid, and the other was the remarkable concentration of the blood in some cases. In two cases the blood was found remarkably thick, viscous, and cohesive to an extent which must have been of itself dangerous to life. While saline solution is indicated, it cannot be relied upon in a patient who is incapable of absorbing fluids. The absence of any necessarily fatal character in the disease is recognized in the pathological study. If the poison can be eliminated or its further production prevented there is nothing in the majority of the lesions which is incompatible with life, and there is demonstrable proof that extensive lesions of the liver of the present type are sometimes followed by spontaneous recovery. Saline irrigation and infusion are apparently most effective in serious stages. *Ringer's fluid* is recommended also. It has proven much more effective than the simple saline solution in many conditions, and there are special indications for its use in the toxæmia of pregnancy which has the features of an acid intoxication. Its composition is as follows: Sodium chloride, 7 grams (15 grs.); calcium chloride, 2 grams (30 grs.); potassium chloride, 1 gram (15 grs.); sodium bicarbonate, 1 gram (15 grs.); aqua dest., 1000 c.c. (2 pints). This solution is best prepared with distilled water recently boiled, and the salts must not be heated enough to decompose the sodium bicarbonate.

ETIOLOGY AND TREATMENT OF ECLAMPSIA. A thorough study of eclampsia with regard to the etiology and treatment was made by Zweifel<sup>1</sup> in the laboratories and wards of the Leipzig Clinic. He reviews the literature of the subject and discusses the theories of Monk, Bidder, Traube-Rosenstein, Bouchard, Spiegelberg, Schümacher, Schmorl, and others. From his and other investigations it seems proven that the

<sup>1</sup> Archiv f. Gynäk., Bd. lxxii., 1904.; American Journal of the Medical Sciences, August, 1904.

cause of eclampsia is a poison which is formed within the patient's body and circulates in her blood. The poison attacks the epithelia of the parenchymatous organs, damages the heart muscle, and seriously disorganizes the blood. To ascertain the identity and nature of this poison was the object of Zweifel's experiments.

He first examined the urine of the patients with respect to the percentage of urea excreted, taking as a basis of comparison the normal amount of urea excreted by man, which represents 83 per cent. of the nitrogenous matter excreted. The amounts of ammonia, uric acid, and albumin were also noted. He studied the amount of nitrogen in the purin bases and compared the amount secreted by healthy patients with that secreted by those suffering from eclampsia. It was found that in eclampsia the amount of urea excreted in proportion to the whole nitrogenous waste was much lessened and that the more albumin there was the smaller the quantity of urea. During the course of a case of eclampsia as the excretion of urea increased the amount of albumin decreased. Therefore, he believes that if a careful record of the quantity of albumin be kept during the progress of a case, it would indicate the increase or decrease in the excretion of urea and thus the condition of the patient could be shown. The condition of the urine in eclampsia is most rationally explained as due to an inefficient oxidation of albuminoid materials. He found that it was impossible, after estimating the quantity of urea in the blood, to use the result as a means for prognosis.

In investigating the salts of ammonium he reviews the results of Zangmeister's experiments. These results showed an increased amount of ammonium compounds excreted in eclampsia. Zweifel's conclusion is that the poison of eclampsia is an organic acid capable of oxygenation and readily changeable into various compounds. He draws attention to leucomains and ptomains, and also to the sulphates in the urine of eclamptic patients as indicating the degree in which the unknown acid remains free or undergoes combination. In his investigations he found that the more severe the attack of eclampsia the smaller the quantity of sulphates in the urine, and so the greater the quantity of neutral sulphur. This result points to a lack of oxidation of the albuminoid materials as the primary cause of eclampsia.

In trying to determine the nature of this acid, Zweifel finds that lactic acid is the only one demonstrated by his investigations which is poisonous and which is not formed in the metabolism of healthy human beings. It is also significant that cases of nephritis without eclampsia do not give the same results when metabolism is studied.

Clinically, he calls attention to the cases of epilepsy in which convulsions occur and are sometimes mistaken for eclampsia. Cases of

poisoning are cited in which patients die in convulsions which are not the usual form of eclampsia. The tendency to eclampsia seen in multiple pregnancy is also remarked, and also the failure of the theory of dilatation of the ureters to account for eclampsia. It is an interesting fact to observe that eclampsia differs in frequency and mortality in different parts of the world. In Würtemberg and Vienna eclampsia is much less frequent than in other parts of the continent of Europe. This is explained by the use of light wines and beverages containing tartrates of sodium and potassium, which combine with bases in the food preventing the formation of lactic acid.

In the prophylactic treatment Zweifel would limit strictly the amount of meat and eggs eaten and encourage the use of fruits and vegetables. Sugar and starch do these patients no harm and may be permitted. He would also give freely effervescing beverages containing the tartrates and carbonates of sodium and potassium. In the actual treatment of the convulsions he calls attention to the danger of using narcotics and especially chloroform for an indefinite period, as fatty degeneration of the heart muscle and epithelia of secreting organs has been observed in these cases. He is not in favor of profuse sweating, as he tried it faithfully and with no benefit. Pilocarpine, he says, should never be employed.

Zweifel was formerly in favor of waiting for spontaneous dilatation of the uterus before delivering the child. His mortality in his treatment by that method was 32.6 per cent. He practised immediate delivery by Dührssen's method of incision for three years, when the mortality sank to 15 per cent. and in some cases as low as 11.25 per cent. Glockner's experience was similar. Bumm divides his treatment of eclampsia into three periods: one in which narcotics were freely used with 30 per cent. mortality; a second period, when in addition to narcotics baths and packs were used, with a 30 per cent. mortality, and a third period when delivery as soon as possible after the first convulsion was practised, with a mortality of 12 per cent. Olshausen had a mortality of 16.9 per cent. It was noted that convulsions ceased in 81 per cent. of his cases after delivery. Zweifel believes that the general practitioner, when confronted with a case of eclampsia with convulsions, should immediately rupture the membranes, and that this will have a good influence in lessening the convulsions. If the cervix be partly dilated the dilatation may be completed by the hand or elastic bags and delivery accomplished by forceps or version. If the vaginal portion of the cervix has not been obliterated he believes that Dührssen's incisions or vaginal hysterectomy or Cæsarean section by the abdominal route should be performed. He does not favor the use of Bossi's dilator.

Considering the want of unanimity upon the subject of the treatment

of puerperal eclampsia, Berkeley<sup>1</sup> was led to obtain the opinions of the leading teachers and practitioners of obstetrics in the United Kingdom, with the object of formulating, if possible, some generally acceptable outline of treatment. With this object in view one hundred and ten circulars were sent out containing various questions. Fifty-six replies were obtained, including the chief authorities upon the subject. The different ways of treating eclampsia are as follows: 1. By the administration of drugs. 2. By venesection. 3. By saline injections. 4. By baths and packs. 5. By abdominal Cæsarean section. 6. By vaginal Cæsarean section. 7. By *accouchement forcé*. 8. By delivery with forceps or version after full dilatation of the cervix.

1. *By the Administration of Drugs.* *Chloral* is given alone or in combination with potassium bromide. The majority of those replying do not use it; nine favored its use, while seven used it under certain conditions. *Chloroform* is used by all for operative measures, and also by the majority at times in combination with other treatment, either during the fits or when other means of controlling them have failed. Various opinions were expressed as to its usefulness in warding off the fits. Two consider it very useful and think it the principal drug, while others consider it dangerous and do not advise it. *Morphine* is used to inhibit metabolism and so stop the formation of poisons. Large doses remove the state of spasm in the renal arteries and so favor urinary secretion. It was found that a majority of those written to used it as a routine measure. Jardine has entirely given up its use, but Croft favors it if there is no marked renal embarrassment. *Pilocarpine* is liable to cause œdema of the lungs and excessive secretion, so that the patient may be practically drowned. The majority of replies did not favor its use. Pearson has seen great benefit from its use, and Bonney always gives it and has never seen any bad effects. *Purgatives* lower the arterial tension, remove any matter in the intestines that may be the source of reflex action, and expel some of the poison. The majority give some kind of a purgative as a routine treatment, but give no particular reason for so doing. Herman thinks purgatives more likely to do harm and advises against them. Kinkhead, Gibson, and Wilson prescribe enemata; Fothergill and Kynoch favor rectal lavage, especially if the patient is comatose.

*Thyroid extract* aids the metabolism of nitrogenous substances, the formation of urea, which is a powerful diuretic, and is a powerful vasodilator, and therefore favors renal activity. A very large majority of those answering had had no experience with it. Nicholson, who has used it widely and recommends it highly, gives 40 grains of the extract,

<sup>1</sup> Journal of Obstetrics and Gynecology of the British Empire, March, 1904.

follows it up soon after with a similar dose, and continues until symptoms of "thyroidism" appear. Maclean and Ballantyne have used it and think well of it.

*Veratrum viride* lowers the blood pressure by dilating the arteries and depressing the heart. It is also said to promote the activity of the skin, to lower the temperature, to relax the cervix, and promote diuresis. It is not very widely used in the United Kingdom, and the opinion seems to prevail that it is not of much value.

2. *By Venesection.* In most cases the value of this treatment seems to be doubtful, although under certain circumstances of overdilated right heart and engorgement of the lungs it is of undoubted value. The great majority of those replying thought that bleeding should only be employed when great cyanosis is present, and should then be followed by a saline injection.

3. *By Saline Injections.* This acts by relaxing the arterioles and lowering the blood pressure, with a consequent greater supply of blood to the glomeruli of the kidney and renewal or increase of the urinary secretion; it also causes diaphoresis and dilutes the poison. Jardine has succeeded in lowering the mortality of eclampsia in the Glasgow Maternity Hospital from 47 per cent. to 17 per cent., the patients in both cases belonging to the same class. Berkeley divides the answers to his circular into four classes: 1. Saline is injected to take the place of the blood abstracted by venesection, which is employed for plethora only. 2. Bleeding is advocated as a routine measure with the intravenous injection to follow. 3. Saline infusion is thought to be contra-indicated; Kinkhead, McCall, and Newnham do not use it, and Spencer is not satisfied that it does any good. 4. The treatment is used as a routine measure and is thought highly of by twenty-five of those who replied.

4. *By Baths and Packs.* The hot-water bath cannot be used if delivery is near, and it is difficult to use if the patient is restless. The patient is wrapped in a sheet and put into the bath, the water being kept at 102° or a little higher for half an hour, then taken out and wrapped in a blanket, then more blankets wrapped around her and she is allowed to sweat for two hours. Herman thinks it is especially called for when a patient is dying from coma, the fits have ceased, the pulse is beginning to fail, and the temperature is normal or subnormal.

*Hot-air Bath.* This acts in a similar way to the hot-water bath and is easier to manage.

*Hot Pack.* Eight of those replying use the hot pack as a routine treatment, fifteen use it for various symptoms, and Targett, Newnham, Wallace, Wright, Kinkhead, and Williamson never employ any of these methods.

*Cold Bath.* This treatment is strongly advocated by Herman in those hopeless cases where, with a very rapid pulse, the temperature steadily rises to the neighborhood of 108°. The temperature of the bath should be between 70° and 80°, and the patient should be kept in it from a quarter to half an hour till the temperature has fallen to 102° F., then be wrapped in blankets and allowed to sweat. Andrews and Routh would also use them under these conditions.

5. *Abdominal Cæsarean Section.* Its indication is said to be in those exceptional cases when the cervix is so very rigid that it cannot be dilated sufficiently to get a bag in, but there seems not to be the slightest indication for its performance as a routine measure. It is a right and proper procedure when, the patient having died during the attack, a living fetus can be detected *in utero*. The majority of answers agreed that this operation is absolutely unjustified for eclampsia. Published statistics show a death rate of 47.7 per cent.

6. *Vaginal Cæsarean Section.* This operation, known as Dührssen's, the majority of those replying considered quite unjustifiable. Munro Kerr performed it in a case of rigid cervix and found it very easy.

7. *Accouchement Forcé* may be accomplished by De Ribe's bag, preceded by Hegar's dilator or tents if the cervix is not large enough to admit it. Twenty-two of those replying use it on certain occasions.

*Manual Dilatation* (Harris' method). If the cervix is rigid great force will be required, and there is danger of lacerating the cervix and a resulting death from sepsis or bleeding. Twenty-eight of those replying use this method on occasion.

*Bossi's Dilator.* Blacker, Spencer, Martin, Ballantyne, Haig Ferguson, Haultain, Kynoch, Munro Kerr, Russell, Jardine, and Byers have all used this instrument and speak well of it. Croft, after having tried it, prefers his fingers.

*Cervical Incisions.* For rapid delivery Dührssen has lately advocated deep multiple cervical incisions. Other authorities advise against the operation, since much surgical skill is required and the extraction of the child often seriously increases the incisions, thereby endangering the opening of the parametrium and laceration of the uterine artery. Haultain advises free incisions if labor has not commenced and Bossi's dilator shows any signs of causing tearing. Jardine advises incision of the cervix if it is rigid, and if there is any difficulty in dilating with Bossi's dilator.

8. *Delivery with Forceps or Version* as soon as possible. Herman alone contends that the only safe and proper treatment is to do absolutely nothing unless some complication other than eclampsia calls for further treatment.

Cases of eclampsia before or at term can be divided into two



classes: 1. Where labor has not yet come on. 2. Where labor has come on. Berkeley, following these two divisions, then attempts to analyze the answers to plainly indicate what line of treatment each authority recommends.

*Where Labor Has Not Yet Come On.* Those who recommend *induction of labor* are Sir John Williams, Eden, Fairbairn, Williamson, Croft, Newnham, Haultain (if before six weeks from term), Stephenson, Byers, Gibson, Kinkhead, Campbell, Jardine, and Ballantyne, the last three if fits are severe.

The following do not induce labor: Andrews, Lockyer, Herman, Stevens, Fothergill, Rankin Lyle, Maclean, Purslow, Ballantyne, Haultain (if within six weeks of term), Munro Kerr, Nicholson, Jardine, Pearson.

Those who hasten labor are Blacker, Bonney, Dakin, Horrocks, McCall, Routh, Champneys, Tait, Hellier, Rayner, Wallace, Wilson, Wright, Haig, Ferguson, Russell. Spencer is not satisfied that this is good treatment unless the os is dilated.

The following leave the case to nature unless it is indicated that more urgent treatment is indicated: Boxall, Duncan, Targett, Donald, Edgar, Martin, Kynoch, and Brice Smyth.

*Where Labor Has Come On.* *Wait till the cervix is naturally dilated and then deliver with forceps or version.* Sir John Williams, Boxall, Horrocks, Targett, Croft, Donald, Fothergill, Rankin Lyle, Campbell, Gibson, and Brice Smyth.

*Manual Dilatation with Forceps or Version.* Lockyer, McCall, Croft (if cervix does not dilate properly), Newnham (twenty-two cases without a death), Wilson, Stephenson, Pearson, and Nicholson.

*Bossi's Dilator with Forceps or Version.* Blacker, Martin, Haultain, Munro Kerr, Russell, and Byers.

*Manual Dilatation or De Ribe's Bag with Forceps or Version.* Boxall, Williamson, Herman, Hellier, Maclean, and Wallace.

*Manual Dilatation or Bossi's Dilator with Forceps or Version.* Bonney, Ballantyne, Kynoch, Jardine, and Kinkhead.

Herman allows no interference of any description, and in the case of the child being dead would certainly let the woman die also without delivering her, as he holds that the woman has more chance if she is left alone than if she is delivered. At the International Congress in Geneva in 1896 the weight of opinion was in favor of emptying the uterus as soon as possible. The great reason for emptying the uterus is to stop the fits; whether it does so in the majority of cases is a matter of doubt. By a careful examination of the original papers of over 1500 cases Herman proves conclusively that fits continue *after* delivery in 52.5 per cent. of the cases. The fits stop *on* delivery in 47.5 per cent.

of the cases. It may be claimed that the *danger* is lessened by emptying the uterus, although the fits do not stop, since the mortality of those treated actively is less than that of those treated expectantly, and that with active treatment the case becomes one of postpartum eclampsia, which is the least dangerous of any variety. Taking the results of over 1600 cases to test this, Herman found that the mortality with active treatment is a little less than that of those treated expectantly, and if recent cases only are taken, where the increased antiseptic precautions are naturally in favor of lowering the mortality of active treatment, the difference of 2 or 3 per cent. is so small that if hurried delivery were indiscriminately practised by all who attend labor in all cases the mortality arising from operative delivery would soon overbalance the trifling and doubtful benefit of emptying the uterus. Porak gave the mortality for *accouchement forcé* as 6.3 per cent. and Bumm states that the mortality from forcible delivery is less than by any other method of treatment. How, the writer asks, is one to reconcile all these different statements and results? Is it possible that eclampsia is in reality, like puerperal fever, a symptom of a number of distinct and separate diseases, and that therefore the results of treatment may differ according to which variety one was treating?

Personally, I believe there is much truth in that query and that eclampsia is not so much a symptom of a number of distinct and separate diseases as a disease with a number of distinct and separate symptoms!

*Treatment by Spinal Subarachnoid Puncture.* A procedure lately advanced for the treatment of puerperal eclampsia is that of spinal subarachnoid puncture. It is suggested by T. Arthur Helme.<sup>1</sup> Our knowledge of the etiology and pathology of this disease is so unsatisfactory that we have been unable to outline any satisfactory basis for treatment. The suggestion offered here is a result of clinical study in two cases which were apparently of the same type of the disease. In the first case the puncture was not resorted to on account of the experimental character of the procedure and other unfavorable surrounding conditions; in spite of the treatment given, the patient died twelve hours after her first violent attack.

The second patient was aged twenty-nine years; she had had morning sickness all through her pregnancy. From the sixth month onward she had suffered from headaches and swelling of the ankles. The urine was scanty. The labor was normal, and when the child was born the mother was quite comfortable. Two hours later she complained of headache, vomited, and had a convulsion; her sight sud-

<sup>1</sup> British Gynecological Journal, May, 1904.

denly completely disappeared at the same time. During the day the convulsions occurred with increasing frequency and severity. At the beginning of the convulsions the patient was irritable between attacks, but later this condition gave way to stupor. The stupor increased to coma and her condition became progressively worse, she having had fifteen convulsions in ten hours. The patient was chloroformed, a pint of normal saline solution was given under each breast and by the bowel, and a spinal subarachnoid puncture was made in the lumbar region from which a drachm and a half of cerebrospinal fluid was withdrawn. The fluid escaped rapidly as though under pressure, and not drop by drop as occurs, for example, in health when the needle is inserted for cocaine anæsthesia. She was seen five hours later and the nurse reported that in the mean time she had had two very light convulsions. Her condition then was very much improved. She was able to talk and recognized those about her, sat up in bed to take her medicine, but was still totally blind. She improved steadily from this time and completely recovered her sight. The albumin disappeared from her urine six weeks after labor. The puncture was made as follows: The patient was placed upon her left side, the trunk flexed as far as possible, and the skin of the lumbar spinal region rendered aseptic. The highest points of the iliac crests were then determined and an imaginary transverse line drawn between these points; the left index finger was placed upon the point where this imaginary line crossed the spine, this point coinciding with the tip of the spinous process of one of the lumbar vertebrae. A hollow needle three and one-half inches long was then thrust into the skin half an inch to the right of the point held by the operator's left index finger; it was directed slightly upward and toward the middle line and pushed onward. By directing the needle in this manner one is able to pass beneath the lower edge of the lamina of the vertebra; otherwise much difficulty is often experienced in reaching the subarachnoid space.

Krönig<sup>1</sup> published a report of three cases of puerperal eclampsia which he had treated by lumbar puncture, followed by a recovery in all cases. Krönig's belief is that as the blood pressure is raised in all cases of eclampsia, so at the same time will the pressure of the cerebrospinal fluid be raised. The first patient was a primipara who had had two convulsions before puncture of the subarachnoid space was made, and underwent another while the cerebrospinal fluid was being drawn off. Following the spinal puncture vaginal Cæsarean section was performed and the fits ceased.

<sup>1</sup> *Zentralb. f. Gynäkol.*, No. 39; *Journal of Obstetrics and Gynecology of the British Empire*, December, 1904.

The second patient had her first convulsion five hours after a spontaneous labor; the first was followed by five others in quick succession. The spinal puncture was then performed and another fit occurred during the procedure. Eleven more convulsions occurred in the following fifteen hours.

The third patient was a multipara who had previously had five normal labors. She had four convulsions when vaginal Cæsarean section was performed and the convulsions ceased. Fifteen hours later she became very drowsy and markedly cyanosed. Spinal puncture was then resorted to and with strikingly good results. Nothing much can be said as to the good effects of the treatment in such a small series of cases; no immediate result after the puncture was apparent.

Henkel also tried this treatment in 16 cases, and his final conclusion was that the drawing off of the spinal fluid had no influence over the course of the disease. He used injections of cocaine and scopolamine after the withdrawal of the cerebrospinal fluid, but he could not recommend this procedure as a sure means of preventing the eclamptic fits.

Four of the 16 women so treated died, a mortality of 20 per cent., which is the average and no improvement in that respect. While no death occurred from a puncture, it should always be regarded as a possibility. In 7 cases nothing could be drawn off; 1 of these cases died and at the autopsy no cerebrospinal fluid was found in the cord and but very little in the ventricles. In 5 cases only from 2 to 3 drachms of fluid could be drawn off. Of these, 2 women died. In 4 cases there was a great increase of the fluid, about 30 cm. being drawn off. Of these, 1 woman died. The spinal fluid was clear, sterile, and alkaline, and contained  $\frac{1}{4}$  per cent. of albumin. Kamann<sup>1</sup> reports a case in which the autopsy also revealed an absence of cerebrospinal fluid. Thus it is seen that with marked anasarca there need be no œdema of the meninges leading to associated hydrocephalus, and, on the other hand, excess of spinal fluid is present when there is no œdema of the body. Henkel concludes that the quantity of the spinal fluid can have practically nothing to do with the production of convulsions in eclampsia, nor are the convulsions much influenced by the intraspinal injections of local anæsthetics.

Reports of additional cases treated by this means have appeared during the year, and while temporary relief from cerebral pressure can be credited to this treatment, there have been no cases that conclusively prove its permanent value. Indeed, even the hope of discovering an antitoxin for the treatment of this disease is limited by the conviction that prophylaxis alone is the hope of the eclamptic. Organs

<sup>1</sup> Münch. med. Wochenschr., 1902, p. 831.

destroyed by degenerative changes can never be restored, and the prospect of reducing the eclampsia mortality lies in the early detection of and correction of the factors underlying its causation. Statistical tables of the results of various plans of treatment that do not include critical study of the variety and severity of cases are really of small value. Hospital treatment alone shows better results than that of private practice, largely because better judgment is displayed in the selection of the treatment applicable to the varying conditions of this disease.

**Icterus and Pregnancy.** Two cases of icterus complicating pregnancy are reported by Bergesio.<sup>1</sup> The first case was that occurring in a primipara who was attacked at the end of her fifth month of pregnancy and died at the end of the ninth month in severe eclamptic convulsions. The second case was that of a woman who in two successive pregnancies developed intense icterus; in the first instance at the fourth month of pregnancy, and in the next at the fifth month. Premature labors occurred on both occasions. In this case the writer noted a diminution in the area of liver dulness, and found great functional derangement of the organ, as evidenced by the urine and feces. Valdagni points out two forms of icterus in pregnancy, the simple catarrhal form and the very grave form. Bergesio raises the question as to whether the latter form is not really an acute yellow atrophy of the liver so far as the alteration undergone by the organ is concerned. He considers that acute yellow atrophy and the grave icterus of pregnancy should be regarded as types of the same disease, the only difference being the cause of their production. From the extreme rarity of the severe form of icterus he maintains that it is unlikely that it is dependent exclusively upon pregnancy, and that the various toxins which produce such a grave condition of toxæmia are not the sole and special products of the pregnant state. The author is unable to explain the reproduction of icterus in successive pregnancies, and the reappearance of severe hepatic symptoms coincident with pregnancy in a woman who, when not in this condition, had perfect liver function.

The pernicious variety of icterus developing during pregnancy is now generally believed to be the result of a severe toxæmia. Whether the toxins are of syncytial or other origin and why in very rare cases the liver should undergo the changes characteristic of acute yellow atrophy are problems awaiting solution.

**Pregnancy and Fibroid Tumors.** It has been very interesting to observe the recent trend of thought of authors who have discussed the surgical relations of ovarian tumors and of uterine fibroids to pregnancy. The risks to a pregnant woman are unmistakably greater from the presence

<sup>1</sup> *Giornale di Ginec. e Pediat.*, 1904, No. 8.

of an ovarian growth, not only during pregnancy, but at the time of labor and during the puerperium. Rapid growth, twisting of the pedicle, necrotic or inflammatory and septic changes so largely increase the risk of an ovarian growth that it has come to be a surgical maxim that an ovarian tumor complicating pregnancy should always, whenever discovered, be removed. The very opposite obtains with uterine fibroids complicating pregnancy. Studies of their life history under these circumstances have brought the conviction that in about 75 per cent. of cases the course of pregnancy, labor, and the puerperium is undisturbed. The maxim here is constant observation of the patient and her tumor, and interfere surgically only when plain indications are present.

Dakin<sup>1</sup> considers the subject of fibroids from the point of view of the effect of childbearing upon fibroid tumors of the uterus. It is important that the behavior of fibroids in this relation should be carefully studied so that the changes in their history, which may be expected to be produced by the presence of an ovum, may aid us in the prognosis and in deciding upon the best time of treatment. In general terms it may be said that the fibroid shares in the changes which affect the uterine muscle while this is developing in pregnancy and also while it is undergoing involution. The tumor often comes under other influences, commonly mechanical, which modify its usual simple course. Much depends upon the relation of the tumor to the uterine wall, whether it be submucous, subperitoneal, or interstitial. Its circulation may be interfered with by torsion of a pedicle, by pressure, or by the change brought about by the contraction of the bloodvessels of the uterus after labor. The writer considers the subject under the headings of Pregnancy, Labor, and the Puerperium.

During pregnancy it has been commonly observed that fibroids grow in practically all cases. The amount of the growth varies from the smallest perceptible amount to a size which makes the uterus pregnant at six months appear the size of a full-term pregnancy. Authorities do not agree whether the growth is most active in the earlier or later months. Could we assume with certainty that a fibroid would not grow after the fifth or sixth month, we could decide what procedure would be necessary in the case of a tumor which by the end of that month had reached a large size, but not a size sufficient to endanger either the woman's life or the termination of the pregnancy. In most cases the growth is a true hypertrophy; in others the increase in size is due to oedema. In the former cases most authorities agree that the hypertrophy of the myoma cells is more marked than that of the proper muscle cells. Doleris does not agree with this statement and says that the

<sup>1</sup> Journal of Obstetrics and Gynecology of the British Empire, August, 1904.

commonest form of enlargement is by increase in the connective tissue. Fibroids, whether submucous, subserous, or interstitial, frequently become oedematous during pregnancy. At times there may be spaces in the tissues filled with serum or in some cases with a brownish fluid containing red corpuscles and lymph cells. Doleris records having found extravasation of blood in the tumor and says that where this occurs there is a good deal of pain, especially if the collection go on to pus formation. Mere oedema, no matter how rapidly it develops, does not give rise to pain. The softening brought about by the oedema is a fortunate occurrence, for a tumor situated in the pelvic cavity is thus enabled to adapt itself during labor to what space there may be, and thus allow a living child to be born where it seemed impossible for the head to get past the obstruction. Necrosis rarely takes place during pregnancy. Peritoneal adhesions occur during pregnancy just as they may in the non-pregnant condition. In this case if strong adhesions are formed they may prevent the ascent of the uterus or if they occur in connection with a pelvic tumor may cause incarceration and abortion. The rupture of strong adhesions by the sudden righting of a tumor or by the artificial reposition of an incarcerated uterus may cause a dangerous intraperitoneal hemorrhage. In a large majority of instances in which there is a fibroid tumor of the uterus there will be a readjustment of the mass before the end of pregnancy, rendering the pelvic canal free for the passage of the fetus. This tendency should be remembered when the question of operating on a fibroid which seems likely to obstruct labor is being considered in the earlier months.

Fibroid tumors in the lower part of the uterus which fail to rise above the pelvic brim during pregnancy or early in labor are very likely, unless they are polypoid, to be injured to such a degree that degenerative and in some instances necrotic changes subsequently take place in them. Labor very seldom finds one of these tumors seriously in the way. Of 5500 patients delivered in the General Lying-in Hospital there was no instance of any obstruction to labor being caused by fibroids. Budin, in the Paris Maternité, and Porak and Macé, in the Charité, have recorded similar experiences. During labor it is common for fibroids to change their position. In most cases, though not so often as in pregnancy, a fibroid will rise above the brim of the pelvis in time to be out of the way of the advancing head; especially is this true of the subserous and interstitial varieties.

Except in those cases where the implantation of the tumor is so low down and generally posterior, and imprisoned by the presenting part of the child, the upper tractile force of the uterus, combined with the plasticity of the tumor itself, will gradually raise it above the brim of the pelvis out of danger. Intraperitoneal hemorrhage may take place

if vascular adhesions of the uterus to surrounding parts are torn. The tumor may also be damaged during labor and afterward slough. A fibroid which has suppurated during pregnancy may rupture with fatal results during labor. Submucous fibroids, and occasionally the polypoid form in which the pedicle has allowed the polypus to come down to the vulva, have been expelled by the advancing head. As pregnancy rarely occurs in the presence of a submucous fibroid (and when it does abortion almost always takes place) it will be noted that the expulsion of a pediculated fibroid during labor is a very uncommon occurrence. Inversion of the uterus during or immediately after the third stage of labor, with spontaneous or artificial detachment, may also occur. Cervical fibroids, if small, have either sloughed or survived in an unaltered condition; the larger ones are squeezed out of their capsule, or when they are discovered to be in the way the capsule may be incised. If a fibroid tumor survives the course of labor without injury it usually undergoes involution along with the normal muscle fibres of the uterus. In some cases it reaches a size smaller than it was before the pregnancy. If this process be repeated on several occasions the tumor may become greatly reduced or, in a clinical sense, may entirely disappear. Regarding the mode of absorption, it seems probable that the myoma cells undergo the same process of involution as the normal muscle cells.

The opinion that it is caused by fatty degeneration is not supported by any weight of evidence. Hammarschlag believes that a myoma undergoes distinct changes in the lying-in period, which often lead to necrosis, and that these changes are brought about by the sudden cessation of the very free blood supply existing during pregnancy. They occur apart from injury or from any perimetritis over the tumor. Other writers, namely, Gusserow and Gebhard, do not concur in this explanation. Gusserow believes that such changes, with the fatty degeneration and pus formation, are due to traumatism in labor. He describes the usual change as consisting in the formation of a cavernous structure owing to shrinking of the muscle cells from the containing framework of connective tissue. These spaces are found to be filled with serum and the final stage is a kind of cirrhosis. Expulsion of the tumor during the puerperium is not uncommon; attention is usually called to them by hemorrhage. In a large proportion of such cases the tumor has been found gangrenous and caused the death of the patient by sepsis.

The writer concludes that in the coincidence of pregnancy with fibroid tumors of the uterus the tumor is not apt to suffer so often or so severely in labor as might be expected, and that a pregnancy complicated in this way will in almost all cases go to term, and that the tumor will survive the stress of labor and the starvation of the puerperium with impunity. There are bound to be cases, however, where labor is brought



to a standstill by a deep-lying fibroid; if the tumor cannot be removed Cæsarean section is indicated.

The results of the studies in 23 cases of pregnancy complicated by fibroids are given by Winter.<sup>1</sup> He discusses the effect fibroids may have upon pregnancy, labor, and the puerperium, and the manner in which the fibroids may be affected by pregnancy.

*Progress of the Pregnancy.* Five cases progressed without any disturbance; 18 had pain of some kind, generally a sense of weight, bearing down, or actual acute pain. The pain was due to various causes, such as contractions of the uterus, circumscribed peritonitis, or secondary changes in the fibroid. Hemorrhage occurred five times, four times in cases of abortion, once in a submucous fibroid. One death occurred from pneumonia after an exploratory laparotomy and one from aneurysm. In 14 cases treated expectantly 9 ended naturally, 3 aborted, and in 2 labor came on prematurely. Labor occurred spontaneously in 9 cases, forceps was used once, and in 1 case a manual extraction of the placenta was necessary. The puerperium was afebrile in 9 cases; phlebitis and thrombosis of the saphenous vein occurred once, and 1 case died of sepsis. His conclusion is that when myomata are present there is generally some sort of a disturbance. It is, however, seldom serious and usually ceases spontaneously. Labor occurs normally if the fibroid be not so situated as to impose an insuperable obstacle to its progress; the third stage gives no trouble, as a rule, and the puerperium is aseptic so long as the usual antiseptic precautions are observed.

With regard to the influence of the pregnancy upon the fibroid, only the cases operated upon were taken into consideration. Of the 5 specimens removed by operation 1 was sarcomatous, 2 were softened, and in 2 there was no change. In 4 cases of myomata removed shortly after pregnancy it is important to note that the growths were necrotic and that the necrosis was no doubt due to the pregnancy. The manner of the change, whether it is due to uterine contractions during labor or to the anæmia of the puerperal uterus, is not known. Myomata rarely require operation on account of pregnancy. Six cases of the 23 were operated upon; 4 were radical operations for fibroids and 2 were conservative. The writer is in general in favor of radical operations for fibroids, but in pregnancy is inclined to a more conservative principle, because in 70 to 80 per cent. of cases reported pregnancy is undisturbed, because the mortality of about 300 reported cases is only 2 per cent., and because the symptoms for which operations are performed during pregnancy are cured as surely as symptoms from fibroids apart from pregnancy are cured by operation.

<sup>1</sup> Monats. f. Geburts. und Gynäkol., Bd. xx., Heft 2,

**MYOMECTOMY DURING PREGNANCY.** Isolated cases of pregnancy continuing after myomectomy are frequently reported. Winter<sup>1</sup> studied the results of 10 cases of subserous myomectomy and of 58 cases of myomectomy for subserointerstitial tumors, the operations performed during pregnancy. Of the latter, 11 cases aborted. He places the infantile mortality at about 20 per cent. The operation being performed during pregnancy does not add to the maternal mortality. He is not an ardent advocate of myomectomy apart from pregnancy, and from his experience concludes that only 25 per cent. of the women who undergo myomectomy are satisfied with the results.

**Extrauterine Pregnancy.** It has only been with the gradual development of abdominal surgery that the relative frequency of this condition has been recognized. The profession in general has not exhibited that keenness and alertness toward extrauterine pregnancy which has characterized its study of appendicitis in the past few years. When that same attitude shall prevail toward obscure and hitherto little understood menstrual irregularities and pelvic pains we shall find the recorded number of ectopic gestations increasing.

The necessity of this attitude of suspicion is emphasized by Lemann,<sup>2</sup> for only by painstaking care will we be able to diagnose correctly the large proportion of cases which vary from the classical picture.

With the history of amenorrhœa for a month or two, accompanied by the usual signs of a normal pregnancy occurring in a woman previously sterile for a number of years, "this amenorrhœa being followed by a period of irregular bleeding from the genitals, the discharge of a decidual cast from the uterus, and occurrence of severe colicky pains in the lower abdomen, one would be led to the diagnosis of extrauterine pregnancy; and if upon vaginal examination the uterus should be found slightly enlarged, though not to the proper size for an intrauterine pregnancy of the indicated period, and further, if a boggy, fluctuating mass be found on one side pushing the uterus over to the other side, we have all the evidence in favor of our diagnosis. If shortly after such an examination we find the patient in collapse, with the signs of internal hemorrhage, we are further confirmed in our opinion by the occurrence of intraperitoneal rupture. But it is just these clean-cut cases which are of such rare occurrence. The symptoms of rupture may be the first to direct our attention to the possibility of any serious intra-abdominal condition. In such a case a coeliotomy is indicated no matter what the cause of the hemorrhage, and a differential diagnosis is not important. In such a case one would have to rely in the main upon

<sup>1</sup> Zeitschrift f. Geburts. und Gynäkologie, Band 1., No. 3.

<sup>2</sup> Medical News, December 3, 1904.

the previous history for a diagnosis, as a pelvic examination would reveal little if anything, the mass having ruptured and the blood being free in the peritoneal cavity. The history of irregular bleeding following an amenorrhœa in a woman presumably pregnant, but who has previously been sterile for a number of years, leads to the consideration of the differential diagnosis from early intrauterine abortion.

"It is usually impossible to determine from the woman's story the difference between the early abortion and the decidual cast of extrauterine pregnancy. In both conditions the uterus may be slightly enlarged and hemorrhage may be intermittent or continued in both." The fact that the patient has been previously sterile or has had pelvic inflammatory trouble will not lend much weight to the side of tubal pregnancy as against intrauterine abortion, nor would the opposite history exclude the extrauterine gestation. A history of recurrent pains, whether sharp and lancinating, or bearing, boring, or dull and throbbing, more especially one or more spells of faintness, indicating partial rupture, will aid in the diagnosis.

A careful vaginal examination is of the greatest importance; there may be no pain or signs of rupture; yet in this quiescent state we may be of the greatest assistance. Examination may still leave the diagnosis problematical, but if we find a fluctuating mass in the broad ligament to one side with such a history we are justified in making the diagnosis.

The writer reports several interesting and abnormal cases illustrating his argument and condenses his belief regarding these cases as follows:

1. That the condition is a more frequent one than most of us now believe it to be.
2. That by maintaining an attitude of alertness and carefully investigating all conditions of menstrual irregularities and colicky pains, we shall find ourselves warranted in establishing an accurate diagnosis and saving the lives of some patients who would otherwise perish.
3. That when the diagnosis is obscure in the presence of a boggy or fluctuating mass to either side of the uterus, we are justified in doing an exploratory operation either through the abdomen or the vaginal fornix.

The relative value of the abdominal and vaginal route in operations for extrauterine pregnancy I have discussed in previous issues of *PROGRESSIVE MEDICINE*. Gradually the vaginal operation is disappearing as the operation of choice, especially in this country, where it has always had a limited following. The same may be said of drainage following cœliotomy for this condition.

**REMOVAL OF THE SKELETON OF AN ECTOPIC FETUS ULCERATING INTO THE BLADDER.** An unusual case of ectopic pregnancy is reported by

Haggard.<sup>1</sup> The patient, aged thirty-one years, had previously borne two children. She presumed herself to be normally pregnant. During the first three months there was a continual flow from the uterus, accompanied by a pain in the bladder with straining on micturition.

At six and one-half months while lying down she felt motion for the last time. After this she was confined to her bed for about four weeks with pain. The pain continued for about a year and she was a semi-invalid from weakness, pain, and tenderness in the lower abdomen. During this time the size of the abdomen gradually diminished. At the end of a year pus first appeared in the urine; the first day following its appearance a fetal vertebra was passed through the urethra. During the second year she attended all her household duties, but would have periods of unusually severe bladder irritation followed by the passage of a bone through the urethra. Sometimes one would stick in the urethra and she would catch hold of the free end and pull it out. In this way she passed eighty-five bones. Six weeks before her admission into the hospital she felt the discomfort of another bone and had not been free from it since, nor had any bone passed.

Examination revealed an exquisitely tender bladder, which crepitated upon pressure, the bones being covered by a phosphatic deposit. The urine was loaded with pus and phosphates, and exceedingly offensive. Micturition occurred every six or eight hours and was very painful. Frequently after urination free pus was often expressed. At operation under ether the index finger was passed into the urethra and detected many bones. An opening was found in the right upper surface of the bladder through which the finger was easily passed; a mass was palpated bimanually to the right of the median line and it was about the size of a small orange. An incision was made through the vesicovaginal septum and fifty-two bones were withdrawn by means of forceps.

Some bones were embedded in granulation tissue in the remains of the ectopic sac and were removed with difficulty. The sac and bladder were frequently irrigated and drainage established through an artificial vesicovaginal fistula. The bladder was irrigated twice daily with boric acid solution and the urine soon became normal. Six weeks after the first operation the fistula was closed by silver-wire suture and the patient made an uninterrupted recovery.

**Ovarian Pregnancy.** Ovarian pregnancy is a very rare condition, not more than twenty cases being recorded in literature. A short review of a study made by Webster<sup>2</sup> of such a case will therefore prove interesting from the fact of its rarity alone. The woman was aged thirty-six years, and had been married ten years. Menstruation began at eighteen;

<sup>1</sup> American Journal of Obstetrics, November, 1904.

<sup>2</sup> Ibid., July, 1904.

it had always been regular and was of the twenty-eight-day type, and lasted from five to six days. She had been pregnant twice previously; the first pregnancy ended prematurely in the eighth month; the last went to term eight years ago. She menstruated normally July 4, 1903. Soon afterward the breasts became tender, firmer, and larger. Nausea gradually developed, and as there was no period in August she considered herself pregnant. September 7th she was taken with severe cramps in the abdomen. She had pallor and felt somewhat faint, but was able to walk to her home, where she went to bed. The pains were relieved by hypodermic injections of morphine. The following day blood escaped from the vagina, and continued about the same time as her normal menstrual flow. It contained clots and shreds of tissue. Colicky and labor-like pains were felt almost continuously, causing her to remain in bed. Morphine was frequently necessary. October 1st blood again appeared and the flow lasted several days. On October 6th her condition was as follows: Abdomen tender to pressure in the right iliac region; a bimanual examination revealed the uterus in good position, slightly enlarged and movable. The left tube and ovary were normal. On the right side of the uterus a mass larger than the uterus and distinct from it was easily palpated. This mass was tender to pressure and only slightly movable. Abdominal section was then performed and about half an ounce of dark fluid was found in the uterovesical pouch. The mass on the right side of the uterus was attached to the rectum and pelvic wall by many delicate adhesions. The right Fallopian tube was freely movable above the mass and was removed with it. The mass was immediately placed in hardening fluid. Webster describes the tumor as follows: An irregular, rounded mass measuring 8 cm. vertically and 7 cm. in its other diameters. The upper fourth is somewhat smooth and dull gray in color; the remaining portion is marked with knob-like elevations, varying in width from 3 mm. to 3.5 cm. These elevations are dark brown or purple, while the intervening depressions are much lighter in color. There was no indication of a rupture of the wall, or of any tubal abnormality. On section two portions were to be distinguished: a thin, peripheral layer and a large, medullary area. The peripheral layer formed a definite outer wall, concentrically striated, gray in color, here and there tinged pink, and containing many bloodvessels. The peripheral layer at its thickest part, at the upper portion near the junction with the broad ligament, measured 5 to 7 mm. In the lower part the thickness gradually diminished to 2 mm. The medullary area formed the main portion of the mass. Its appearance was mottled, presenting pink, red, brown, purple, gray, and yellow areas. Striation was everywhere seen, being irregularly or in parts radially marked. In the lower and outer por-

tion, just external to the middle of the swelling, was a cavity (amniotic), whose lining was smooth and glistening and of a blue-gray color. It contained a few drops of turbid fluid and measured 2.2 cm. transversely and anteroposteriorly and 1.5 cm. vertically.

Microscopically, the peripheral layer was composed of connective tissue with the fibres running in all directions, though for the most part they are parallel to the surface and closely packed together. The connective-tissue cells were largely spindle-shaped, though some were round and oval. They corresponded in size to those found in the normal non-pregnant ovary.

"At intervals large, rounded, spindle, oval, or polygonal cells, varying somewhat in size, are found in the connective tissue. They possess usually a well-defined border, the cell substance presenting a more or less homogeneous consistence, in which under a high magnification a reticulated structure can generally be distinguished; the nucleus is large and stains deeply, the nucleolus being well marked. In some cases two nuclei are found, occasionally three. The cells in some cases have a hyaline appearance and their outlines are lost. They may be blended with other cells or with surrounding connective tissue, presenting hyaline degeneration. In these the reticulated structure may be lost; they may be vacuolated and the nuclei may be irregular or fragmented. These cells are mostly found in that part of the gestation sac near the hilum and in the layers nearest to the ovum and near large blood spaces. Away from the blood spaces few of these cells are found, and they are usually single."

What these cells were is difficult to determine; they resembled decidual cells closer than any other. It does not seem likely that they were wandering cells derived from the syncytium, because the nuclei were much larger and the cell substance is not so dense as that of the syncytium found on the chorion. Also in the majority of instances there was a definite cellular arrangement, the outline of each cell being well marked; they were not the irregular nucleated strands which are found invading the mucosa in uterine and tubal pregnancy. The cells were also much larger than those of the layer of Langhans in the chorion. There was some resemblance to wandering lutein cells, but the only portion of the corpus luteum found in the specimen was situated at a considerable distance from that part of the wall in which the large cells were chiefly noticed, and its cells were smaller than those under consideration and much degenerated; the characteristic yellow pigment of the lutein cells was also absent. Many of the cells resemble those found lining the wall of some blood sinuses, and in some parts seemed to be continuous with the latter, which appeared to be proliferated endothelium.

This extension around vessels of proliferated endothelium Hubrecht described as being characteristic of the changes in the mucosa of the hedgehog during early pregnancy. The appearance presented in certain parts of this specimen of ovarian pregnancy is somewhat suggestive of a similar change. "Small pieces of fetal syncytium are found in the thickest part of the sac wall. In most instances they appear to lie in spaces. There is very little indication of the invasion of the wall from the surface to which the ovum is attached. The syncytium and villi are found on the latter only at considerable intervals, a layer of thick fibrin formed from extravasated blood occupying the great extent of this area. The amnion was fairly well preserved. The chorionic epithelium consists of syncytium and Langhans' cells arranged in two or more layers. Degenerative changes are present. Buds of syncytium and villi are attached to the chorion and resemble those structures as they appear in uterine and tubal pregnancy. Between the chorionic layer and the gestation sac wall of ovarian tissue there is a large mass of tissue consisting of blood in various stages of alteration and chorionic elements—*e. g.*, villus stems, villi and masses of syncytium in various stages of degeneration."

Webster declares the topographical relations of this specimen to be beyond dispute. The ovum was situated entirely within the ovary. Both van Tussenbroek and Thompson believed that in their respective specimens the gestation must have begun in the ripe Graafian follicle. As there was no corpus luteum present in this case, if it developed in a Graafian follicle it was in one in which there was no formation of corpus luteum.

In the description of follicular development of ovarian pregnancy, it is usually assumed that the ovum is fertilized *in situ* in the follicle. This has not been proven, and in the absence of a corpus luteum in the wall of the gestation sac in this specimen it would seem that the ovum had developed elsewhere than in a ripe follicle. The feature of greatest scientific interest in connection with this whole subject is the method of the early embedding of the ovum in ovarian pregnancy. Webster, on phylogenetic grounds, believes that the fertilized ovum in the human female can only *begin* its development in tissue derived from the Müllerian tract. That Müllerian tissue does occasionally extend to the ovary the studies of De Sinety and Melassez, and especially those of Whittridge Williams, leave no doubt. Schmorl and others have directed attention to the occasional occurrence of small localized areas of decidua-like cells in the ovary in cases of uterine pregnancy. Out of ten specimens examined by the writer these changes were found in four. In each instance the areas were situated in the cortex at or near the surface, sometimes projecting from the cortex, sometimes extending for a

considerable distance into it. The cells in these areas had the closest resemblance to the uterine decidua in normal pregnancy, and the line of demarcation from the surrounding ovarian stroma is always well marked. These areas also contain dilated bloodvessels, which are not found in the neighboring unchanged ovarian stroma. These areas he has never found in the ovaries removed from non-pregnant women. These cortical localizations of decidua-like cells in the ovary of pregnancy suggest some special characteristic which makes the cells capable of undergoing the same genetic reaction which is ordinarily found in the uterine and tubal mucous membrane when pregnancy develops in relation to these tissues. Tentatively he advances the view that these areas represent detached portions of Müllerian tissue which have become attached to the surface of the ovary. Occasionally he has found in the substance of such an area a gland-like space lined with columnar or cubical epithelium. The latter may be only a derivative of the surface germinal epithelium, but it may represent included Müllerian epithelium. The special genetic action in these areas may sometimes determine the embedding and growth of a fertilized ovum in the ovary, and if they be Müllerian in origin all cases of ovarian pregnancy would support the dictum that the fertilized ovum in the human female begins its development in Müllerian tissue. The proof of this is impossible, but all *a priori* evidence is in its favor. Admitting that no definite decidual layer was found in the specimens considered in this discussion, we do not know that they were not present at a much earlier period. Webster believes that, although no definite layer of decidua is found in his specimen, there is little doubt that the scattered groups of large cells found in the ovarian stroma, nearest the ovum, were decidual in character.

He concludes with the statement that for several years he has held the belief that decidual transformation is peculiar to the Müllerian tract. The occasional presence of areas of decidua-like cells in the ovary in pregnancy has been cited as an exception, but it remains to be proved that these areas are not Müllerian in origin. Small localized decidual nodes have also been found in the broad ligaments. These he believes are also derived from detached portions of Müllerian tissue which are quite common in the upper portion of these ligaments. Similar areas have also been found under the peritoneum of the pouch of Douglas, and these may also be detached portions of Müllerian tissue.

**Pyelitis Complicating Pregnancy.** Pyelitis complicating pregnancy is a comparatively rare condition, but it is of sufficient frequency to require a thorough study and clear recognition. Cragin<sup>1</sup> says that a

<sup>1</sup> Medical Record, July 16, 1904.



pain in the right side of the abdomen accompanied by tenderness arising during pregnancy is frequently due to pyelitis. Two factors tend to produce it: a compression of the ureter by the enlarged uterus, and an infection of the urinary tract above the compression. As the urine is secreted under very low pressure, moderate compression will shut off the flow through the ureter. The right kidney is most commonly affected. As to the source of the infection, it is usually the colon bacillus. This organism was found to be the cause of three of the author's cases. Pyelitis usually occurs between the fifth and eighth months. The diagnosis may be made by a tenderness in the region of the kidney, elevation of temperature, and acid urine containing pus. Appendicitis, typhoid fever, and salpingitis are the three conditions most likely to be confounded with pyelitis. Palpation of the abdomen in advanced pregnancy is often difficult, and the tenderness may correspond closely with McBurney's point. The history of the case and a bimanual examination will usually enable one to differentiate between pyelitis and salpingitis. Typhoid fever is to be recognized by the clinical history and the Widal test.

The treatment should consist of rest in bed, a liquid diet, with a free, copious ingestion of fluid. If the pain is severe an ice-bag may be applied over the kidney; if this does not give relief a small amount of an opiate may be given. Should this treatment not give relief and the pain becomes more severe with higher temperature, a surgical operation may become necessary. Termination of the pregnancy for this cause is seldom if ever necessary.

**Severe Hemorrhage from the Bladder during Pregnancy.** Kubinyi<sup>1</sup> reports a case of this character and believes that he has to deal with a condition analogous to the bleeding of hemorrhoids. The patient was discovered to have a greatly distended bladder. Catheterization was tried, but failed to relieve it. He then dilated the urethra to admit a finger, when it was found that the internal meatus was occluded by a blood clot. As the finger was removed a large amount of blood and urine gushed out. After emptying the bladder a closer inspection revealed varicose veins of the legs; a cystoscopic examination of the bladder was then made and the same condition of the mucosa of the bladder was found; anterior and above the neck of the bladder was found a large, horizontally directed vessel which was surrounded by clouded mucosa. This the author believes was the source of the hemorrhage. Schroetter believes that the varicosity is due to an increased blood pressure in the vein and to an insufficiency of their valves. The author attributes the increase in blood pressure in his case to lifting done by

<sup>1</sup> Centr. f. Gynäk., 1904, No. 98; American Medicine, January 14, 1905.

the patient, which was followed by the bleeding. Such hemorrhages may at times be of such a severe character that cystotomy and packing will have to be resorted to.

**Thrombosis of the Internal Iliac Vein during Pregnancy.** The rarity of thrombosis of the vessels of the lower extremity during pregnancy and the unsatisfactory and scanty reports of its etiology have led Goldsborough<sup>1</sup> to report a case which occurred in the hospital service. The writer was only able to collect 10 cases in the literature; of these, 3 were lacking in many important details. In the cases of Bonnet-Laborderie and Gripat the thrombosis occurred in both legs. In the former the left internal saphenous vein was affected, while the location of the lesion in the right leg was not stated, the author designating the condition as spontaneous phlebitis. In the latter, the right femoral vein was thrombosed, but no mention was made as to which vein was involved on the left side. The author ascribed the condition to toxæmia of pregnancy, associated with chronic anæmia resulting from paludism. Of the 5 cases in which only one leg was affected, the left femoral vein was involved in the patients of Brindeau, Audebert, Saint-Ange, and Bacon, while in Beaudry's case the right saphenous vein was the seat of the lesion. In no instance was the etiology clear. In 2 cases pregnancy terminated spontaneously at the fifth and eighth months, in 6 the patient went to term, and in 2 no information regarding this point was available. Only 2 of the cases suffered from fever, and all recovered with rest and immobilization of the affected parts. Goldsborough's case occurred in a white woman, aged twenty-nine years, who was admitted to the obstetrical department complaining of constipation, nausea, vomiting, and swelling of the left leg. She was in the ninth month of her first pregnancy, the course of which had been practically normal until four days before admission. She had attended to her work until one week before admission and she thought was able to conceal her condition by a specially constructed corset which compressed her abdomen. A week before entering the hospital she was compelled to go to bed on account of marked oedema in her left leg. Her bowels did not move during this period and four days later she began to suffer from nausea and vomiting. The uterus was seen to be deflected to the left side and it reached to the costal margin; the child lay in the right occipitiliac transverse position. The patient's left leg was enormously swollen from the toes to the groin; the skin was white and glistening and pitted on pressure. Thrombosed vessels could be palpated in the groin and at the saphenous opening. The pulse was 80 and well sustained with moderate tension. There was no sugar or albumin in the urine. Her

<sup>1</sup> Johns Hopkins Hospital Bulletin, June, 1904.

bowels were opened, but the nausea and vomiting continued during the succeeding forty-eight hours, and it was determined to induce labor. A De Ribe bag was inserted at 5 P.M.; four hours later pains started and gradually became more effectual; the bag burst at 3 A.M. the following morning and the pains gradually disappeared. At 10 A.M. the cervix was dilated by Harris' method and the child delivered by version; the placenta was removed manually and a lacerated perineum repaired. She died fifteen hours after delivery. At the autopsy the lumen of the left common iliac vein was completely occluded where it was crossed by the right common iliac artery. From this point as far down as the dissection was carried, the vessel was filled by a thrombosed mass which extended into the external iliac and from it into the femoral and saphenous veins. The vein was perfectly normal above the point of compression. Cultures taken from the heart's blood and from the thrombus at the time of the autopsy were absolutely negative; nor could the most thorough examination of stained, hardened specimens reveal the presence of bacteria. These negative results would seem to eliminate the possibility of a bacterial origin. After considering all the possibilities the writer concludes that the cause is to be found in the corset which brought the pressure to bear at the point where the vein and artery crossed. As pregnancy advanced and the pressure increased the lumen of the vein was completely obliterated, with stagnation, coagulation, and thrombosis following in order.

**Pregnancy following Operations for the Correction of Displacement of the Uterus.** The choice of operation for women during the childbearing period of life has in recent years been largely influenced by the results upon subsequent pregnancy and the effect of pregnancy and parturition upon the permanency of the operation. These questions are increasing in importance since conservative surgery upon the appendages has become a fixed principle at the hands of most gynecologists. Our aim now is to save for the woman when possible her procreative function, and operations to correct retrodisplacement are very commonly associated with plastic and conservative work on the appendages and thus have an added interest when studied in their relations to pregnancy and labor. Hoyd<sup>1</sup> reports a series of cases of the Alexander operation for the relief of sterility. In 12 cases followed by pregnancy the uterus remained in perfect position at periods of examination varying from two months to five and a half years. Beyea<sup>2</sup> studied the results in 465 cases of retroversion treated by a method of ventrosuspension designed especially to avoid complicating pregnancy, and declares that it has

<sup>1</sup> American Journal of Obstetrics, November, 1904.

<sup>2</sup> University of Penna. Med. Bulletin, November, 1904.

never complicated labor nor produced an abortion. Of the patients whose subsequent histories were traced 153 were married and 41 have been pregnant since the operation, of whom 37 were delivered of living children at term. Five have had two children; 9 have aborted, 5 doing so twice, and all before the sixth month. Holden<sup>1</sup> reviewed the results of 445 cases of ventral suspension done in the Johns Hopkins clinic. He says that the great majority bore no symptoms during pregnancy or labor referable to the operation, and the only adverse symptom is abdominal pain during pregnancy. Recurrence of the displacement may occur after labor, but does not necessarily follow. If labor does not intervene the proportion of recurrences is not more than 5 per cent. L. F. Garrigues<sup>2</sup> reports 12 pregnancies following vaginal fixation performed on 120 cases; there were 3 abortions, and of these 1 patient subsequently carried the pregnancy to term. All labors were normal. V. Guerard<sup>3</sup> reports 51 normal deliveries in 57 labors following ventrofixation. Five cases required forceps. In 41 labors after vaginal fixation 39 were normal, the forceps at the outlet being used in 4 cases.

The frequent reports of isolated cases of complications during pregnancy and labor do not apparently entirely agree with the above excellent showing. That these operations do interfere with the course of pregnancy and labor is further attested by the growing popularity of the round-ligament operations, either through the inguinal canals or the abdominal incision. The dangers are unmistakably greater after *fixation* and are diminished by a technique that avoids or prevents that result, but it is a significant fact that, except at the hands of a few operators, utilization of the round ligament is growing in favor as a means of correcting backward displacement, and especially where subsequent pregnancy is expected to occur.

**Operations during Pregnancy.** Many conditions may complicate pregnancy which at the present time are submitted to surgical treatment never attempted in the past or undertaken with an anxiety not felt at the present day. Intra-abdominal complications, such as appendicitis, ovarian and other tumors, now serve as indications for prompt surgical treatment during pregnancy.

J. C. Webster<sup>4</sup> has reviewed the various conditions that call for operation during pregnancy. Incarceration and impaction of the gravid uterus, accompanied by old and dense adhesions, should not be subjected to the risk of forcible manipulation to secure replacement, but

<sup>1</sup> American Journal of Obstetrics, April, 1905.

<sup>2</sup> International Journal of Surgery, November, 1904.

<sup>3</sup> Monatsschrift f. Geb. und Gynäkologie, xix., No. 2.

<sup>4</sup> Illinois Medical Journal, April, 1904.

as an alternative to inducing abortion abdominal section and careful release of adhesions are to be considered.

Pregnancy occurring in a uterus bound down by old inflammatory masses, accompanied by tenderness and a history of previous abortions, indicates the same treatment. Complications in the urinary tract may demand prompt surgical treatment. A stone in the bladder should always be removed, and pyonephrosis calls for surgical treatment or the termination of pregnancy. Pyelitis or ureteritis not accompanied by enlargement do not usually demand surgical treatment. Intra-abdominal bleeding from any source calls for immediate operation to control the bleeding. Tumors of the vulva—hæmatoma, cyst, or abscess—may be removed with safety. The last is a danger of infection after labor that should be removed. Non-interference in cases of appendicitis is more dangerous than operation, and a woman who has had an attack should have her appendix removed before she becomes pregnant.

Obstruction of the bowels, of course, may demand surgical relief independent of the pregnancy when the latter is present. Webster advises surgical operations for gall-bladder disease complicating pregnancy only when the conditions are urgent. His advice as to fibroids and ovarian tumors coincides with what we have noted above as to their complications. Operable carcinoma of the rectum calls for emptying the uterus and later removal of the malignant disease. When inoperable the pregnancy should be allowed to continue and Cæsarean section done at term.

### LABOR.

**The Act of Labor Observed on the Isolated Uterus.** Some very interesting physiological and pharmacological experiments have been recorded by Kurdinowsky.<sup>1</sup> They were made upon the isolated uterus and have to do with the act of labor. The uterus of a rabbit with the adnexa was removed under ether narcosis after having previously injected it from the aorta with Locke's fluid, thus removing all the blood. The organ was then placed in a specially prepared chamber and kept moist with Locke's fluid. The uterus retained its responsiveness to stimuli for two or three days. In two cases the writer was able to observe the act of labor in a pregnant rabbit uterus from beginning to end. The wave of contraction begins at the cornua and progresses toward the body of the uterus, thus resulting in the separation of the embryo from the uterine wall. When separation has taken place the embryo is slowly pushed from the cornu into the body of the uterus; this act is accom-

<sup>1</sup> Archiv f. Gynäkol., vol. lxxiii., No. 2.

plished simultaneously in both cornua. Ring-like contractions then begin in the body of the uterus and the fetus is gradually pushed into the vagina. The broad ligaments take an active part in the contractions which force the fetus into the vagina, and so soon as this has been accomplished they cease their activities. This experiment seems to show that the uterus can perform its expulsive function in itself without any stimulus from the central nervous system. The uterus was stimulated in various ways, and it was found that heat and chemical stimuli strengthen the contraction, but in so doing often make them tetanic in character. Electric stimuli had very little effect. Ergot affected the uterus in a peripheral manner, and produced contractions independent of any contractions of the vessels. Narcotic poisons, such as chloral and alcohol, have little effect. Adrenalin in very dilute solutions was found to increase the uterine contractions more than the so-called specifics and should be further studied in this relation.

**Antepartum Measurement of the Fetal Head.** At a meeting of the New York Obstetrical Society, December 13, 1904, Dr. W. S. Stone<sup>1</sup> made a preliminary report upon the method of measuring the fetal head with the ordinary pelvimeter. The two poles of the fetal head, the occipital and frontal, are first palpated in the ordinary manner to locate them. An assistant standing at the foot of the table places the ends of the pelvimeter between the ends of the ring and middle fingers of the palpating hands and presses them in as the one who is palpating directs and reads off the measurement upon the scale. He has now collected 42 cases in which this method has been tried, and the measurements compared with the occipitofrontal measurements after delivery. In 27 cases the measurements were exactly right; 13 showed an error of 0.25 cm.; 2 showed an error of 0.50 cm. Further measurements will be taken and presented with detailed reports of the cases.

**Significance of Fever during Labor.** The fever of labor had not been studied to any extent until within the last few years, when Vinay and Ravon made important investigations. Cumston<sup>2</sup> has reviewed this question. It is not a frequent complication, and Vinay says that if the rectal temperature be taken several times during labor upon women about 3 or 4 per cent. of them will be found febrile. There are two different forms of the fever, a slight and serious form. The slight form is, in the majority of cases, due to the result of a long labor, the membranes having been ruptured for several hours and dilatation being incomplete. The temperature in this class varies between 100.4° and 102.5°, and is about the only pathological symptom present. There is no chill and the pulse rate is in relation to the temperature. The

<sup>1</sup> American Journal of Obstetrics, February, 1905.

<sup>2</sup> New York and Philadelphia Medical Journal, October 1, 1904.

patient's appearance is normal, and with the end of expulsion the temperature reaches normal and does not rise again during the postpartum period.

The serious form is ushered in by a sudden, violent, and prolonged chill, accompanied by vomiting, agitation, and general malaise. The rectal temperature reaches 104° or above that. The pulse is rapid and more or less irregular. Usually the membranes are unruptured and dilatation is incomplete. The general condition becomes progressively worse, and by palpation during the intervals of pain the uterus will be found painful and contracted. Vinay calls particular attention to this tetany of the uterus during labor and to the exaggeration of the pains, which are constant symptoms. When labor ends the temperature does not fall, or, if it should incline to fall, goes up again in a few hours. There is great thirst, dry tongue, a leaden hue, and an anxious expression of the features; the general condition becomes serious and often ends in death. That this fever is infectious is certain, but how are the pathogenic bacteria introduced? A period of incubation of several days is required before the symptoms appear, and in many cases no vaginal examination had been made before the beginning of labor. The penis of the husband should then be suspected as the transporting agent of the bacteria. Ravon reports three cases in which a recent coitus was certainly the cause of contamination. In one sexual intercourse had taken place two days before labor, in the second four days previously, while in the third it had occurred the night before. Vinay points out that "it is sufficient to recall the filthiness of the genital organs of certain men in order to realize the possibility of infection by this means, and if it is admitted that the finger of the obstetrician can be the agent of infection, one can hardly deny that the penis can exert the same influence." The importance of this etiological factor is so great that in the obstetrical clinic at Leipzig, among other questions put to patients, is that of the date of the last coitus.

In the milder form of these cases the prognosis is good for both mother and child. The fever and other symptoms disappear with the birth of the child or a few hours after, and in general do not recur during the postpartum period. The severe type has a much graver significance, for in reality it is a precocious puerperal septicæmia, with all its inherent dangers and complications. The only prophylactic treatment which can be of benefit is to advise the husbands to refrain from sexual intercourse with their wives during the latter months of gestation, and the strictest observance of a rigid asepsis by the obstetrician when he considers it absolutely necessary to make a vaginal examination before or during labor.

In the conduct of the milder form of these cases there is no reason

for interfering. Rigorous antiseptic precautions should be taken, and if the second stage be too long delayed and the patient shows evident signs of exhaustion, with an increase in the height of the fever, with her general condition poor, and the child beginning to suffer, the labor should be terminated. This is an absolute indication when there is an infection of the amniotic fluid, with a temperature above 102.5°, with a rapid pulse, general weakness, and great tenderness of the uterus. Labor should be terminated in the interest of both mother and child in the manner called for by the indications present.

**Preventive Treatment of Pelvic-floor Lacerations.** The prevention of lacerations of the structures constituting the pelvic floor during labor is considered by some writers as only secondary in importance to the preservation of the lives of the mother and child. Edgar<sup>1</sup> believes that deep lacerations are avoidable in normal, ordinary cases of labor, and that the great importance of avoiding rupture of the pelvic-floor structures cannot be overestimated. It is a well-known fact that many gynecological cases owe their origin to lacerations of the pelvic-floor structures during labor. Pelvic-floor injuries comprise ruptures of the fourchette, posterior vulvar commissure, perineum, the lower third of the anterior, posterior, and lateral vaginal walls, and rectovaginal septum.

The results of ten years' observation in the obstetrical clinic at Halle, of every known method for protection of the perineum, show in primipara that 21.1 per cent. suffered lacerations extending beyond the commissure, and in multipara 4.7 per cent.

The factors which tend to produce, directly or indirectly, pelvic-floor lacerations are: 1. Too rapid expulsion of the fetus, causing tearing instead of stretching of the pelvic-floor tissues. 2. Relative disproportion in size between the presenting part and the parturient outlet. 3. A faulty mechanism of labor, whereby a larger circumference of the head and shoulders than necessary passes through the parturient outlet.

From his extended clinical experience the writer recommends: 1. The preliminary digital stretching of the vulvar outlet in primiparæ, and especially in elderly primiparæ, as a prophylactic measure in perineal protection. This he performs by passing two fingers of one hand, palmar surfaces down, into the parturient outlet and making intermittent backward and lateral, massage-like pressure. The motion is a sort of eccentric massage. Fifteen to twenty minutes of this firm backward and outward, rotary, massage-like stretching will usually sufficiently enlarge the most rigid parturient outlet. The best results are obtained with the use of ether or chloroform. There are, of course, certain kinds of pelvic-floor rigidity that will resist this and every other method of prophylaxis.

<sup>1</sup> American Journal of Obstetrics, July, 1904.



2. *Episiotomy.* He offers nothing new under this head, believing that the greater the clinical experience the more infrequently will the operation be required.

3. *Head Delivery.* The practice is to have the delivery of the head so slow that stretching of the parts and not tearing will take place. Delivery of the head is secured in the interval between the uterine contractions because the pelvic-floor muscles are relaxed to their greatest extent at this time.

4. *Cleidotomy.* Division of both clavicles in dead fetuses as a preliminary to delivery of the shoulders has for its object the lessening of the bisacromial diameter. The writer believes that this operation has never taken its proper place in obstetric surgery as a valuable means of lessening maternal morbidity and mortality. In those cases brought into his hospital service where delivery has been impossible on account of the wedging of the shoulders, and in other accidental cases where the shoulders still remain within the pelvis, he divides the clavicles as a routine measure and says it is amazing how the diminution of the bisacromial diameter thus produced renders the subsequent extraction of the fetal shoulders a comparatively easy task. In his experience the operation reduces the bisacromial diameter from four and three-fourths inches to four inches, or from 12.7 cm. to 7.5 cm. For the operation a pair of heavy straight or curved obstetrical scissors of the Dubois type is used, two fingers of one hand being used to guide the blunt points to the middle of each clavicle. The fetal head should be flexed to one side strongly to give room for the use of the scissors.

5. *Shoulder Delivery.* It is his belief that the posterior shoulder is responsible for many cases of deep pelvic-floor laceration, and that many cases of moderate lacerations caused by the head are often increased by the subsequent passage of the posterior shoulder. The writer found that when the head was lightly supported the posterior shoulder was born three times as often as the anterior in 69 primiparæ and two and a half times as often in 68 multiparæ, and further that the posture of the woman did not appear to affect the mechanism of shoulder delivery. The method employed for shoulder delivery is as follows: (a) Delay the delivery of the shoulders if possible until nearly complete rotation of the bisacromial diameter has taken place. (b) Take the fetal head in the hand and gently elevate it until the anterior shoulder is brought up well behind the symphysis, thus bringing the cervicoacromial diameter into the outlet instead of the bisacromial. (c) The posterior shoulder is now allowed to pass out spontaneously, and whenever possible manual extraction should be avoided, thus decreasing the risk of perineal rupture. (d) While the anterior shoulder is held behind the symphysis the fetal hand of the opposite arm will usually soon appear

in the vulva lying across the chest. This forearm should now be slowly flexed out through the vulva, thus delivering the posterior shoulder by slight traction on the posterior arm. (e) Should the foregoing procedure be impracticable and should delay occur in the delivery of the posterior shoulder, gentle traction upon the head, the fingers encircling the neck, is preferable to traction with a finger in the axilla. (f) Should there be delay in the delivery of the anterior shoulder after the posterior is born, make traction directly downward with the hands placed on the sides of the head, taking care not to make too great pressure upon the perineum. As a last resort traction may be made by a finger in the axilla.

**Anæsthetics.** CHLORIDE OF ETHYL IN OBSTETRICS. The use of chloride of ethyl in obstetrics is described by Plauchu.<sup>1</sup> He has administered it in 40 obstetrical cases as follows: 10 c.c. of the drug are sprayed into a compress of gauze folded into eight thicknesses. The compress is hollowed in the hand or folded in the shape of a funnel and placed over the nose of the patient. The patient is instructed to breathe deeply and narcosis takes place in about one minute.

The writer used the drug as an exclusive anæsthetic, also as a preliminary to a more prolonged general anæsthesia. It was used in painful obstetrical examinations, also in the application of forceps, the rapid extraction by breech, and version. Its administration was followed by comfort. My experience coincides with the above report in regard to the use of this drug in instances where a temporary anæsthesia is required, such as in painful examinations and at the end of the second stage of labor. Where deeper and prolonged anæsthesia is required ether is preferred. Merck's chloride of ethyl has proven the most dependable.

**SPINAL ANÆSTHESIA IN OBSTETRICS.** The constant experimenting with different drugs and modes of administering them is evidence that spinal anæsthesia has not yet reached a degree of success sufficient to warrant its general use in obstetrics. This is also the opinion of Clark<sup>2</sup> who reviewed Stolz's work in the June number of *PROGRESSIVE MEDICINE*, p. 220.

Martin used Bier's method of lumbar anæsthesia in over 30 cases and reports his results.<sup>3</sup> He used a solution which was made of a combination of *adrenalin and cocaine*. 1 c.c. of an adrenalin solution (1:2000) was injected into the spinal canal under Schleich's local anæsthesia. Five minutes later 0.8 to 2 c.c. of a cocaine solution was injected. In only one case was anæsthesia confined to the genital organs alone. In the

<sup>1</sup> *Annals of Gynecology and Pediatrics*, 1904, No. 9.

<sup>2</sup> *Archiv f. Gynäk.*, 1904, Band lxxiii.

<sup>3</sup> *Münchener med. Wochenschrift*, October 16, 1904.

other cases complete anæsthesia, usually extending up to the lower ribs, was obtained. In some cases the whole trunk was rendered analgesic. The duration of the anæsthesia varied from half an hour to four hours. It was his experience that pregnant women bore spinal anæsthesia very well, and he concurs with Stolz in respect to the after-effects not being bad or disagreeable. Severe vomiting occurred occasionally, but there were no rigors with rise of temperature in any case. Tuffier's method of controlling the untoward effects of the anæsthesia by subcutaneous injections of caffeine-sodium-salicylate did not appear of any benefit in his hands.

This form of anæsthesia, it was noted, impaired the activity of the uterus both as regards the number and force of the contractions. The bearing-down pains were especially affected, for the abdominal muscles were only brought into play when the patient was urged to do so. When the labor was completed within one and one-half hours after the injection there was scarcely an unpleasant sensation during the whole process of delivery, even though it necessitated the use of forceps. The processes of involution and lactation were in no way interfered with. It is Martin's belief that this method of anæsthesia should not displace chloroform in private practice. Further experimental experience he believes will teach that it produces no harmful results.

Several writers, among them Chaput, claim that stovaine has certain advantages over cocaine in intraspinal injections. Stovaine dilates the vessels, slows the pulse, does not tend to cause syncope, and permits of operations being performed while the patient is sitting up. It is said to be less toxic than cocaine and can therefore be employed in larger doses. Occasionally after-effects are a slight headache and back-ache, with a slight rise of temperature. Chartier<sup>1</sup> presents the details of 11 cases in which he has used *stovaine*. He used a 10 per cent. solution made up with sodium chloride. He injected 5 to 8 drops—i. e., 2½ to 4 cg. of stovaine. Complete anæsthesia was obtained in from six to eight minutes after injecting the solution and lasted from three-quarters of an hour to one hour. Stovaine like cocaine acts as an oxytocic. There is no danger of tonic contraction if the dose is not larger than 2 to 5 cg., and this dose may be repeated if necessary. Injection of stovaine for surgical purposes is of course contraindicated in pregnant women. The fœtus apparently did not suffer from the toxic effects of the drug. No immediate bad after-effects were noted in the mothers. In 6 out of 11 cases, however, the patients suffered later from more or less violent headache, chiefly frontal, pains in the eyes and spine, giddiness, nausea, and vomiting. These phenomena, while never alarming,

<sup>1</sup> La gynécologie, October, 1904; Journal of Obstetrics and Gynecology of the British Empire

persisted until the eleventh day in two patients. Quinine was found to be the most useful drug in the treatment of these symptoms.

**Accidents of Labor. TREATMENT OF ACCIDENTAL HEMORRHAGE.** This subject was fully treated by Macan.<sup>1</sup> He describes it as arising from accident, from disease, and from some failure in the mechanism of labor. As regards the mechanism of this condition he finds that the healthy uterus cannot be distended to any considerable extent by blood pressure. The placenta has great power of accommodating itself to changes in size of its site, and is not so easily separated as the membranes. Gravity and peristaltic action of the uterus need not be considered. The hemorrhage in spreading follows the line of least resistance

Accidental hemorrhage is caused by increased action of the heart, obstruction to the return of venous blood to the uterus, disease of the uterine vessels, sudden lessening of intrauterine tension, and diminution in size of the placental site. When the heart action slows, the tendency of the hemorrhage is to stop; increased intrauterine tension from effused blood or intrauterine contraction or adhesions also tends to stop the bleeding. The formation of thrombi produces a like result.

On the other hand, increased heart action, fresh separation of the placenta, diminished coagulability of the blood, a very rapid flow of blood, with adhesions between the placenta and membranes to the uterine walls, tend to increase the bleeding. Diminished intrauterine tension has an important bearing, and may arise from the giving way of the uterine walls, the absence of uterine contractions, blood escaping from beneath the placenta, or rupture of the membranes. Where hemorrhage is but slight and from the centre of the placenta it may remain internal. Adhesions between the placenta and membranes or wall of the uterus, distensibility of the uterine wall, and the presenting part acting as a plug tend to cause the hemorrhage to remain internal. When these conditions are not present, especially when the bleeding begins near the margin of the placenta, blood will escape externally. It is very important in these cases to consider the effect of rupturing the membranes and the effect produced by contractions of the uterus on the hemorrhage. Rupture of the membranes lessens intrauterine tension and tends to increase hemorrhage. Uterine contractions do not cause hemorrhage to stop, for it is not the contraction of the womb but its retraction which controls bleeding. Uterine contractions may cause hemorrhage when the contraction ring is high in the abdomen and the site of the placenta is lessened, when there is delay in the birth of the after-coming head, or when a shoulder presentation is neglected.

After the birth of the first of twins, or where excessive amniotic liquid

<sup>1</sup> British Medical Journal, 1904, No. 2286.

escapes, the uterus often contracts, but does not retract, and hence hemorrhage arises. During a contraction hemorrhage is arrested if the supply of blood is cut off and intrauterine tension is increased.

As regards diagnosis we cannot distinguish between a low insertion of the placenta with bleeding and external accidental hemorrhage.

In recognizing internal hemorrhage, when symptoms of shock with abdominal pain are present, we must suspect hemorrhage, but frequently we cannot diagnose it until after the expulsion of the placenta. When the hemorrhage is concealed we appreciate its nature from the fact that the symptoms are out of all proportions to the quantity of blood lost. It is of great importance to know if possible how much of the hemorrhage is internal. Regarding treatment, we may be able to prevent this accident by curing endometritis, by lessening arterial tension and venous congestion, by dealing with nephritis, and by giving remedies which shall increase the coagulability of the blood. In the treatment of the hemorrhage itself we try to arrest the hemorrhage without emptying the uterus if possible. This may be attempted by placing the patient at absolute rest, giving opium, and lessening congestion by salines. The escape of blood may be prevented by firmly tamponing the vagina or cervix and by making firm pressure on the uterus either by the hand or with the vaginal tampon and abdominal binder; aided by a perineal compress and bandage we may increase uterine tension, thus causing the hemorrhage to cease; measures which retard the flow of blood help in the formation of thrombi.

Macan believes in tamponing by the Rotunda method as follows: Sterilized cotton-wool, in masses the size of a large walnut, soaked in an antiseptic solution is used. After cleansing and catheterizing the patient the fingers of one hand are used as a speculum; the tampons are wrung dry and packed firmly about the cervix. This is done as tightly as possible and until no more can be introduced into the vagina. A large strip of iodoform gauze is then placed over the tampons, projecting from the vagina and forming a firm perineal pad. A strong binder is firmly pinned from above downward, starting above the fundus, and to this is added a firm perineal bandage, the whole making very tight compression.

The after-treatment consists of warmth, warm liquid food, and one-half grain of morphine hypodermically; the physician is notified if uterine contractions begin, if the perineal pad begins to bulge, if hemorrhage comes through the dressings, or if the patient grows faint. Of 43 cases so treated 2 died: 1 (undelivered) from hemorrhage, the other from rupture of the uterus. In conducting labor in these cases the membranes must not be ruptured if possible. If pains become vigorous, the perineal bandage and part of the tampons should be removed. The contrac-

tions of the uterus will force out the remainder and the membranes should not be ruptured until full dilatation has been secured.

In summing up his paper Macan says that from his personal experience he is entirely in favor of performing Cæsarean section in these cases in preference to rapid dilatation of the cervix, and would be in favor of vaginal Cæsarean section. He believes that rupture of the membrane is not good treatment of this condition, unless it causes rapid expulsion of the child. Where during labor the membranes persist unbroken in the second stage and hemorrhage begins, such bleeding is immediately controlled by rupture of the membranes and the termination of labor.

Galabin has seen accidental hemorrhage completely internal from partial degeneration of the placenta with a living fetus. He believes that rupture of the membranes is followed by increased intrauterine tension and hence that it tends to diminish hemorrhage. He did not find, on examining the statistics of the Rotunda before treatment by tamponing was introduced, a very great improvement in the mortality. He thought Cæsarean section might in some cases increase shock to a fatal issue. Kerr, of Glasgow, has observed a mortality of 20 per cent. in these cases, with an infantile mortality of 95 per cent. In some cases the hemorrhage ceases spontaneously, no other treatment than rest being given. If the operator decides to rupture the membranes a foot should be brought down in addition. In severe cases Kerr thought Cæsarean section was clearly indicated.

Byers was also in favor of Cæsarean section in concealed accidental hemorrhage. In cases where the hemorrhage was external with absence of labor pains, he believes in the method of tamponing described by Macan. He called attention to statistics from the Rotunda of 56 cases where forcible delivery was employed in serious conditions with 6 deaths. In a second series of 57 cases where forcible delivery was not done, but tamponing was used instead, there was but 1 death. In the last two reports from the Rotunda there were 34 cases without a death. Nicholson had seen good results from dilating the cervix and emptying the uterus, and especially with the use of bipolar version. Ergot, quinine, and digitalis had given good results after the delivery of these patients. Continuous hemorrhage from the lower uterine segment after delivery was best treated by tamponing with iodoform gauze wrung out of adrenalin solution. The administration of saline solutions was also useful in these cases.

**Placenta Prævia.** The etiology and treatment of placenta prævia are discussed by Sinnetamby.<sup>1</sup> According to Sinnetamby, Peters' descrip-

<sup>1</sup> Journal of Obstetrics and Gynecology of the British Empire, September, 1904

tion of the formation of the decidua reflexa is the one generally accepted. The ovum after reaching the uterine cavity rapidly changes into the compact layer of the uterine decidua by the phagocytic action of the trophoblast. The excavation is made deeply and laterally; the deeper the excavation, the thicker the reflexa, especially the basal portion.

The functional activity of the villi of the chorion is believed to depend upon the vascularity and thickness of the deciduæ that surround it. If the lower reflexa fulfils this function a reflexal placenta results, which finally becomes united with the decidua vera of the cervical zone unless rupture and hemorrhage provoke premature expulsion of the ovum. This is not the only mode of formation of the placenta prævia. Webster has exhibited specimens of placenta prævia of serotinal origin, and has drawn the conclusion that only a low implantation of the ovum could explain the serotinal origin of a placenta prævia.

Sinnetamby believes that while this may be true in a good number of cases where the placenta is entirely serotinal and is wholly implanted in the lower segment, it cannot be so in cases having the characteristics of Webster's specimen, for this shows placenta of serotinal as well as reflexal origin. This he believes can only be explained by the ovum having entered the compacta in the usual manner, and working its way downward between its layers until it reached the lower zone. "The ovum is usually fertilized in the Fallopian tubes, and by the time it reaches the uterus its trophoblast becomes functionally active, and it at once burrows into the mucous membrane of the fundal portion of the uterus. But should the functional activity of the trophoblast be delayed until the ovum reaches the lower uterine segment owing to late fertilization, it is not unlikely that the ovum would attach itself in that zone with the formation of a serotinal placenta prævia. An ovum devoid of trophoblast cannot attach itself and will be carried away by the ciliary current, in the absence of any intrinsic motile powers of its own, from the Fallopian tubes down to the cervix." In the reflexal variety the growth of the ovum stretches the reflexa, which may give way and produce hemorrhage and abortion, or the accident may occur by the chorionic villi becoming very active and rendering the reflexa weak and liable to rupture. This accident generally occurs before the fourth month, before the reflexa meets the vera. If the reflexa escapes this accident it becomes blended with the vera, which may be partial or complete. If there is no complete blending of the reflexa and vera the reflexa may give way and produce hemorrhage any time between the fourth month and full term. In the latter pregnancy may go on until interrupted by the separation of the placenta consequent on the canalization of the cervical canal and descent of the ovum.

"In the serotinal variety the hemorrhage is due to the separation of the placenta during dilatation of the cervix. Hemorrhage may then occur at any time during the course of pregnancy, and some of the unrecognized cases of abortion and accidental hemorrhage are due to this abnormality."

The mortality in placenta prævia is high. The maternal mortality varies from 15 to 40 per cent., while the fetal mortality is much higher. According to Galabin it is 60 to 75 per cent. The objects to be attained are: 1. Prevention and counteraction of shock. 2. Checking of hemorrhage. 3. To promote uterine contractions. 4. Facilitate dilatation of the cervix. 5. To expedite delivery after sufficient dilatation of the cervix. It is seldom that patients are seen with this abnormality in the early stages; in hospital cases the os is usually sufficiently dilated to admit one, two, or more fingers or to put in place a Champetier de Ribes bag. If the os will admit two fingers the membrane is ruptured at once and the bag introduced. If the membrane is not ruptured the hemorrhage is not completely arrested and there is always a further tendency to separation of the placenta, with resulting asphyxia of the child. This is caused by the bag lifting up the membranes and effecting a separation of the placenta, which when the membranes are ruptured will retract with the dilating cervix, thereby ensuring a complete compression by the bag. If the placenta prævia be of the central variety it should be perforated to reach the membranes. If there is no bleeding and the pains are strong the bag may be left alone until expelled by natural means, when the forceps may be applied and delivery effected. If the bag does not entirely control the bleeding and there is a slight oozing, traction or a weight may be applied to the bag, supplemented by a firm abdominal binder. Sinnetamby considers saline transfusions as the sheet-anchor in the treatment of placenta prævia. He says that when one gets a case in which there has been a good deal of hemorrhage, the os half-dilated, the hemorrhage stopped, and the placenta partially detached, with pulse feeble and frequent, the first impulse is to deliver at once by the traditional treatment of version. His results in this procedure have been disastrous. The sudden emptying of the uterus after severe hemorrhage produces such a severe shock as to defy all known restoratives. This fatal collapse is counteracted by the use of early saline rectal injections or transfusions under the armpit, according to the circumstances. Four pints of salines are generally given, two per rectum and two into the cellular tissues. During the seven years ending 1903 he had treated 34 cases of placenta prævia, with 7 deaths. During the three years when the above treatment had been carried out, 22 cases with no deaths have been the result. The success is ascribed to early saline transfusions, Champetier's bag, and patience.



**Treatment of Postpartum Hemorrhage.** The treatment of postpartum hemorrhage is discussed by Hart.<sup>1</sup> He includes hemorrhage in the third stage of labor in his subject, but thinks that hemorrhage with adherent placenta should receive separate consideration. In both these varieties it is necessary to separate the placenta and membranes by hand. Several anatomical conditions favor the separation of the placenta; they are: (1) a spongy or perforated space where separation may occur; (2) a special thinning of the walls of the afferent and efferent bloodvessels before they emerge from the uterine muscle; (3) a special development of muscle which grasps the vessels of the wall. The clots which form in the mouths of the thin-walled vessels when they are torn through are of great importance. The retraction ring which contains the circular vein of the uterus is the dividing line between the two major divisions of the genital tract, and drains the blood away from the portion of the uterus which is above it during the first and second stages of labor. All above it is active; all below it is passive.

The accoucheur will generally be warned by the character of the labor when hemorrhage is threatened. A long, hard labor, the use of instruments, a history of flooding in previous labors, long-continued sterility, endometritis, multiple births, placenta prævia, etc., all indicate the possibility of postpartum hemorrhage. Hemorrhage from above the retraction ring is usually due to muscular relaxation in which the vascular sinuses are not compressed. Hemorrhage from below the ring may be due to lacerations of vessels which have no enveloping network of muscular structure to grasp them. Bleeding from such a source should be accurately diagnosed first, then controlled by pressure or sutures. The conditions vary in hemorrhage from above the contraction ring.

"1. This variety occurs during the third stage of labor. The uterus is soft, blood flows from the vulva, and the placenta is within the uterus. The uterus must be squeezed and a hypodermic injection of ergotine given. Should this be ineffective the cervix must be grasped in the fingers of the right hand while the other hand grasps the fundus, and bimanual compression and anteflexion performed. This should be followed by a hot vaginal douche. Should this fail, the placenta is probably adherent and must be removed by hand. After removal the uterus must be again compressed until all danger of hemorrhage is over.

"2. This variety occurs after the third stage is over and may be treated by (a) abdominal compression of the uterus; (b) bimanual compression and manipulation; (c) hot vaginal and hot uterine douches. A double-current catheter should be used and the reservoir held at such

<sup>1</sup> Practitioner, October, 1904.

a height that the water will not flow with too great force into the uterus. If these measures fail, the uterus must be plugged by packing it with iodoform gauze in three-inch strips; the packing should be done gently and may be allowed to remain twenty-four to forty-eight hours. Venous or submammary infusion of normal saline solution may be necessary in bad cases. Other measures which may be necessary are aortic compression, bandaging the limbs, and elevation of the foot of the bed.

"3. Hemorrhage from adherent placenta and danger of sepsis. The bleeding is more profuse when only a portion of the placenta remains attached. The left hand is used to steady the uterus while the right hand is inserted to remove the obstruction. Placenta and membranes must be stripped away intact if possible. A uterine douche should be given and a tampon may also be required.

"4. Hemorrhage from adherent membranes. The hemorrhage in such cases is not so profuse if the placenta is entirely detached and the uterus will diminish in size. In these cases the hand should be inserted and the adherent membranes detached."

**Inversion of the Uterus.** The treatment of inversion of the uterus by the application of the Champetier de Ribes bag is discussed by Mantel.<sup>1</sup> The treatment is based upon the writer's results obtained in treating 5 cases of complete inversion by this method. The first case was not seen by him until fourteen months after it had occurred. It was due to traction on the cord in the third stage of labor. At the time there was copious hemorrhage, which was soon checked; persistent hemorrhage continued for fourteen months, rendering the patient very anæmic. An attempt was made to reduce the inversion under anæsthesia. Failing in this, a Champetier de Ribes bag fully inflated with air was applied. The patient died the following day. The remaining 4 cases were recent; 3 occurred during the third stage of labor and 1 a few hours after delivery, apparently due to straining at micturition. They were all treated by the same method and all recovered. Traction on the cord is the prime factor in the causation of this condition. In the case which occurred some hours after delivery Mantel believes that the inversion began during the third stage of labor and was completed by the straining of the patient. Straining in itself is not sufficient to produce the inversion, but once inversion has begun straining may complete it. The author believes that the implantation of the placenta in the fundus of the uterus is an important factor favoring inversion. These cases were all seen after their occurrence, and in the writer's opinion were all due to bad management of the third stage of labor and should not

<sup>1</sup> Gaz. méd. de Paris, September 10, 17, 1904; October 1, 8, 1904.

have occurred. Regarding the hemorrhage, text-books on obstetrics all mention severe hemorrhage as a natural result of this accident.

In Mantel's 5 cases it was absent in 3 and insignificant in the other 2. In the first case which had persisted so long, the hemorrhage became an important factor, but the primary hemorrhage was slight and easily controlled. The writer states that either his experience has been peculiar and unique or the text-books need revision upon this point.

Regarding puerperal infection there was in no case any serious rise in temperature, and yet the application of the bag was delayed, its earliest use being five days after delivery. It is the writer's belief that freedom from infection was due to closure of the vessels by the inversion and to the perfect and free constant drainage of the uterus.

He suggests that inversion be practised on uncontrollable postpartum hemorrhage on the one hand, and intractable infection on the other. If called to such a case the obstetrician should practice the most rigid asepsis and return the uterus to the vagina. One should not attempt to obtain immediate manual replacement of the uterus, as from Mantel's experience there is no fear of hemorrhage, and he attributes acute infection, hemorrhage, and gangrene to this practice. If the uterus will not easily remain in the vagina it should be held in place by a light gauze pack and vulvar pad. This with rigid asepsis is all that should be done in the first few days of the puerperium.

After five or six days the largest-sized Champetier de Ribes bag should be introduced and filled with air, not water. Great stress is put upon this point, as, if filled with water, the bag is incompressible and becomes too rigid and hard. When in place the bag must be disturbed as little as possible, and only removed to allow of micturition and defecation. The bladder should not be emptied too frequently, as he regards a full bladder as an aid to reposition. The bag acts mechanically and reflexly, the pains are very severe, and there is a tendency to syncope, but the condition is really more alarming than grave. As soon as reduction has been accomplished the patient is at ease. In no case was it necessary to resort to morphine or other drugs to relieve the pains. Mantel believes that in the majority of cases this accident is not one of great gravity, and barring improbable complications the inversion will be reduced in a few hours by the application of the bag filled with air,<sup>1</sup> on the fifth day of the puerperium.

<sup>1</sup> Journal of Obstetrics and Gynecology of the British Empire, December, 1904.

### THE PUERPERIUM.

**Puerperal Infection.** THE BACTERIA OF THE VULVA AND VAGINA. The abandonment of the vaginal douche in modern obstetric technique is largely the result of bacteriological studies of the vaginal secretions. The latter have not been uniform in their findings, but the tendency of recent writers is to regard the vulvar secretions as commonly infectious, and that the vaginal secretions have the power to disarm any infectious organisms that may be present. Pietz<sup>1</sup> found pathogenic germs in the vulvar secretion of pregnant women in 68 per cent. of the cases, in the urethra in 32 per cent., and in puerperal women the vulvar percentage was 100 and the urethral 86. He states that in pregnancy there is a great decrease in the number of bacteria in the secretions and a great increase in the puerperium. His examinations of the urethral secretions before and even after careful vulvar disinfection show the dangers of catheterization, and especially to the puerperal woman whose bladder has been reduced in resistance by the traumatism of labor.

**PREVENTION AND TREATMENT OF INFECTION.** Careful vulvar disinfection, the reduction to a minimum of vaginal examinations, and the wearing of rubber gloves sterilized by boiling are the recent and most enlightened means of preventing puerperal sepsis. The use of antiseptics in vaginal douches, either to prevent or to cure puerperal infection, has almost wholly passed away. The constitutional treatment of puerperal sepsis has changed but little. Supportive treatment is still the keynote. From some quarters comes the belief that very large amounts of alcohol are harmful, and that sugar, either cane or grape, being a valuable form of nourishment, may be substituted. The value of salt solution to favor elimination and to dilute toxins is more and more appreciated. Serum therapy has not made much progress and is likely to remain of little practical value until further advances have been made in the bacteriochemical investigations of infection and in the manufacture of various sera. The surgical treatment of puerperal sepsis has been fairly well restricted. Its usefulness in localized infections is certain; for generalized infection it is limited or valueless. The mortality in hospital practice is steadily being reduced; while in private practice but little if any improvement is noted.

Jardine<sup>2</sup> states that the problem of septic infection has been solved in the maternity hospitals. In considering the question of private obstetric work we are met with the astounding fact that deaths from puerperal fever are more frequent than they were in preantiseptic days. Milne Murray has given the following statistics regarding it:

<sup>1</sup> Zentralblatt f. Gynäkologie, 1904, No. 17.

<sup>2</sup> Journal of Obstetrics and Gynecology of the British Empire, March, 1904.

TABLE I.—*Mortality from Puerperal Fever in England and Wales.*

1847-1856.	Early anæsthesia; no antiseptics . . . .	1.8	per 1000.
1875-1884.	Anæsthesia general; early antiseptics . . . .	2.28	"
1886-1895.	Anæsthesia general; antiseptics general . . . .	2.46	"

TABLE II.—*Childbed Mortality in Scotland.*

	Accidents in childbed.	Puerperal fever.	Total.
1897 . . . . .	331	205	536
1898 . . . . .	351	227	578

He attributes much of the increase of maternal mortality from 1847 onward to, first, the misuse of anæsthesia, and, second, to the ridiculous parody which, in many practitioners' hands, stands for the use of antiseptics. The proper use of antiseptics can do the same in the private work of physicians as it has done in the maternity hospitals. If obstetricians will conduct their cases with the same care as surgeons employ in their operations, sepsis will be rare. Mortality will be reduced and morbidity will be greatly lessened. Sepsis, while it does not always kill, may leave behind some morbid condition from which the patient will suffer, more or less, during the remainder of her life.

At the onset of labor in ordinary cases the contents of the uterus are aseptic. In the vast majority of cases pyogenic organisms are not found in the vagina; there are, however, present many bacteria which are non-pathogenic and protective. They are most efficient scavengers and have the power of destroying virulent organisms like staphylococci. The external genitals are extremely septic and special care should be observed in rendering them aseptic. The sanitary surroundings of the patient should be good; her bedding and clothing should also be clean. The external genitals should be rendered as clean as possible. The internal passages are aseptic and should not be touched, as further cleansing will do harm in removing the protective organisms. The risk commences when we make an internal examination or pass any instrument into the aseptic canal. Much can be done by external palpation, but it is impossible to entirely do away with vaginal examinations even in normal labors, and in assisted labors internal manipulations are absolutely necessary. Therefore, our manipulations should be as limited as possible and the utmost care should be used in regard to asepsis.

In making a vaginal examination the hands and arms should be as carefully sterilized as for an ordinary surgical operation. The external genitals should also be sterilized. The external genitals of the patient must be exposed to view and the labia should be separated with the fingers of the other hand. The same care and precautions should be used in operative cases and the instruments should be carefully sterilized. A certain amount of exposure is necessary, and if the physician will explain the reason no difficulty will be found in securing consent. Limit

vaginal examinations and carry them out under the strictest possible aseptic precautions. Do not allow a labor to be prolonged until the woman begins to show signs of exhaustion. Twenty-four hours is usually taken as the extreme limit of a normal labor, but this in many cases is far too long. In labors lasting over twenty-four hours the mortality is four times greater than in those under twenty-four hours, while in those lasting over thirty hours it is twelve times greater.

Prolonged labor is therefore dangerous not only from the probability of the exhaustion killing the patient, but because of the greater liability of the patient to sepsis from the lowered vitality of the tissues. Therefore Jardine believes it is far better to render a little assistance early than to do the whole delivery later when nature has absolutely failed.

Conduct the third stage of labor with the utmost care and see that the uterus is completely emptied. It is all very well to say that the uterus will expel anything retained in it; and so it may, but before it has done so the probability is that septic invasion will have occurred and the whole system of the woman will have been poisoned by the absorption of ptomaines or organisms to an extent which will endanger her life.

After delivery thoroughly cleanse the external parts and apply an aseptic napkin to the vulva. This part should not be delegated to an attendant unless that attendant is a thoroughly trained nurse, and even then it is better to see to it yourself. During the puerperium the napkins should be changed as often as they become soaked, and the parts cleansed with an antiseptic wash. If the attendant is not a qualified nurse she should be instructed to thoroughly cleanse her hands before she touches the patient, and insist on her using clean rags or swabs of gauze tissue. A non-poisonous antiseptic should be used for this purpose.

In ordinary cases douching should not be practised, but it should be used in cases of postpartum hemorrhage after severe operations, or where the uterine contents were septic. Douching is not necessary during the puerperium unless septic absorption has commenced. The best form of douche is a continuous one with a glass nozzle syringe which can be sterilized. Jardine usually uses a lysol (1:100) solution for douching, although sterilized water and normal saline are good; if corrosive sublimate is used sterilized water should be used afterward to wash out the albuminate of mercury which deposits on the canal. From his large experience he has no hesitancy in stating that aseptic methods give far better results than antiseptic methods.

**Antiseptic Treatment of the Puerperal Woman.** A PLEA FOR FREQUENT VAGINAL DOUCHES. The antiseptic treatment of the puerperal woman which is most frequently carried out is, according to Kolipinski,<sup>1</sup> not

<sup>1</sup> Medical News, December 31, 1904.

enough. This treatment he outlines as follows: The protection afforded to the woman by nature is due to the acid state of the vagina, and the sterile lochial discharges which expel minute organisms or yield but a barren soil for growth. The local and general antepartum cleansing of the patient, the cleanliness of the nurse, the attention to the cleanliness of the person, hands, clothing, and instruments of the obstetrician are necessary; and, further, the injuries are to be kept germ free postpartum by a cleansing of the external genitals, by a single vaginal douching to remove blood and clots, by the use of vulvar pads or lochial guards, frequently replaced, and by an occlusive dressing.

Kolipinski says that these contused and lacerated varieties of wounds of the cervix, vagina, and its outlet, which, when not protected are the chief causes of puerperal infection, septic, puerperal, or childbed fever, require surgical treatment which is in its action both curative and preventive of any other pathological process. One of the best treatments in thoroughness and efficiency is irrigation, which embodies the essential act of drainage. Douching the vagina is a form of this and has been generally abandoned as both inefficient and harmful, and has increased the death rates of hospitals in a marked degree. It has grown to be feared as a maker of mischief equal almost to the intra-uterine douche, or as is the curette when septic fever is active. The principal of the occlusive vulvar pad in theory and from clinical experience has not much to commend itself when the problem of treatment is the prevention of infection so prone to occur in a woman just delivered. He believes that the minute and exact details of precautions to which the physician subjects himself, the nurse, and his implements, are very much overdone and overtrusted. The mode and vehicle of contagion is the ordinary and every-day contact and exposure of a wound not protected, and not the rare and extraordinary modes of inoculation, such as from hands contaminated in the dissecting rooms or at an autopsy.

In the treatment of a wound by irrigation, where tissue is necrosed, half-dead, or of low vitality, the douche in its local or general action must not be poisonous and its quantity must be unlimited. Its action must be like the continuous flow of surgical practice. Kolipinski believes that undoubtedly the evil results from vaginal douching are due to blunders in these fundamental requisites. These blunders are: (1) the use of corrosive sublimate, of carbolic acid, or of some of its substitutes; (2) the employment of a very limited quantity. He has used antiseptic douching in normal puerperal cases and has found the effects to be in every way satisfactory, both in the feeling of general comfort to the patient and in the avoidance of septic fever or its speedy destruction. He believes in following the rule of flushing with too much rather

than with too little. The method consists in washing out the vagina, vulva, and cervix (the patient being placed in the proper position), with a gallon of a solution of boric acid in tepid water of the strength of  $1\frac{1}{2}$  drachms to the pint. This is repeated three times a day for the first week and then discontinued altogether. Septic fever has not been found to appear in any normal case, and the antiseptic vulvar pad has been dispensed with or its use left to the discretion or wish of the nurse or patient. Boric acid he considers the most suitable antiseptic, as it has none of the objectionable effects of other therapeutic bodies of its kind, and while three douches a day are sufficient, four are not too many, and make the result all the more sure. He makes a plea that the antiseptic vaginal douche be not condemned on its past record, but be used with confidence in the way here described, after the manner of prolonged irrigation and in large quantities.

**Puerperal Pyæmia.** The treatment of puerperal pyæmia by the Trendelenburg method of ligating or excising the thrombosed veins, with or without an accompanying total extirpation of the uterus, is thoroughly discussed by Opitz.<sup>1</sup> The results of this operation have been very discouraging, only 1 case out of 10 operated upon recovered. The statistics of the Berlin clinic, where only the severe cases are admitted, show under the older methods of treatment 33 recoveries to 41 deaths. While the operation may be justified in selected cases it is next to impossible to select the case, for it is almost impossible to recognize the gravity of a case of pyæmia. The apparently mild cases may rapidly grow worse and the grave cases may recover after a prolonged illness. Pyæmia following abortion is much more fatal than that after a full-term confinement, while after criminal abortion the prognosis is even worse. The difficulty in ascertaining the facts in such cases makes this knowledge of little value in the selection of these cases for operation. An analysis of the full-term cases in the Berlin clinic show that those arising after intrauterine operations, such as manual removal of a placenta or after placenta prævia, were of much more serious import, probably from direct infection of the placental veins. The gravity of the disease was much the same whether it began early or late in the puerperium. More than half the fatal cases perished within three weeks, so that it would appear that those who could resist the disease for that length of time had a fair chance of recovery. Age is of no importance in the prognosis; a strong heart and a good capacity for assimilating nourishment are the most important factors to be considered. While the writer believes that in the future we may obtain some help from a leukocyte count, at present it is no help. Summing up it may be said that the

<sup>1</sup> Deutsche med. Wochenschrift, 1904, Nos. 25, 26, and 27.



prognosis in puerperal pyæmia neither justifies the Trendelenburg operation nor gives any information as to when it is indicated. Considering the operation from the anatomical standpoint the writer says that did one or both ovarian veins contain infected thrombi the operation would be a simple matter, but this is not often the case. The hypogastrics are frequently involved and their removal with their wide ramifications would involve a complete clearing out of the pelvis with the whole of the internal genitalia, which treatment very few pyæmic patients are in a position to withstand. The postmortem records show too general a diffusion to justify such a radical procedure. An early operation would be an unnecessary one in many cases, and even then there would be some uncertainty as to whether the infection were sufficiently localized for removal.

The same conditions are confronted in total extirpation of the uterus after the method of Schulte, for the first rigor means that the infection has spread to the pelvic veins and that the removal of the uterus alone would be futile. Hence other than surgical measures must be relied upon in this disease. The writer gives the method of treatment he adopted in those cases which came under his own care. Of 18 cases treated 13 recovered, 4 died, and in 1 the result was unknown. This gives a percentage of recoveries of 23. These results he attributes largely to general treatment, and especially to the administration of a lessened amount of alcohol. No remedy is known which has a direct influence upon the disease; so the treatment consists in keeping up the body strength and assisting in the elimination of poisons. Nourishment should consist of milk and eggs, with some of the easily digested proteid preparations, such as sanato-gen, somatose, or plasmon. Alcohol should only be given in small quantities, preferably in the form of some light wine. Large doses of brandy or the heavy wines usually cause marked depression of the heart after the stage of stimulation is passed. Sugar, either cane or grape, is a very valuable form of easily assimilated nourishment, and may be freely given in drinks, gruels, egg-flips, etc. Its administration leads to an increased consumption of fluids which assist in the elimination of toxins by the kidneys. Salines, given by the bowel or subcutaneously, are also recommended to aid in the elimination of the toxins by the kidneys. If the patient have an offensive diarrhœa it must not be checked, as this is one of the means by which nature rids the body of the bacterial toxins. Obstinate constipation is a serious condition; the writer reports 3 of his cases having been so affected and all proved fatal. He recommends calomel for this condition.

Absolute quiet to minimize the chances of dislodging infective clots must be imposed and the patient must be kept strictly to the dorsal position. The danger of hypostatic pneumonia can partly be gotten

rid of by having the patient take several deep breaths at intervals or by applying cold cloths to the chest. He considers Hofbauer's nuclein treatment, phenacetin, and antipyrin of value. The Credé silver injection is considered valueless, but the collargol intravenous injection is more likely to prove efficient. Serum and turpentine injections are unfavorably commented upon, also all intrauterine manipulations except the removal of retained products of gestation.

**Thrombosis and Embolism in the Puerperium.** The following results have been observed by Richter<sup>1</sup> in his studies, which included 16,000 maternity cases in Leopold's clinic. Twenty cases of embolism, 78 of thrombosis, and 18 of puerperal pulmonary affections were recorded. Sixty per cent. of the cases of embolism ended fatally with the first attack; in some instances a mild attack preceded the second severe and fatal one. As a careful prophylaxis may prevent embolism it is important to be acquainted with the earliest signs or symptoms of its onset. Mahler has called attention to a rise in the maternal pulse as being the first sign of thrombosis. The writer was able to demonstrate this in 63 per cent. of his cases without any doubt; in 34 per cent. it was demonstrated with some doubt on account of the presence of fever.

In the cases of pulmonary embolism it was plainly evident in 42 per cent. of cases, while in 52 per cent. it was doubtful.

It is the writer's belief that this rise in pulse rate is more important than those symptoms which are generally accepted as characteristic—*e. g.*, rise in temperature, variable hyperæmia in the affected limb, and pain in the hip and side. This increase in pulse rate is due to the production of new collateral circulatory channels about the obstructed point in the vein. This obstruction brings about increased cardiac resistance, which the heart of the pregnant woman can only overcome by an increased number of contractions.

It is the writer's belief that thrombosis of the pelvic veins is less dangerous than that of the lower extremities. In the latter condition large thrombi are freed, which are necessarily more apt to be fatal; in the former condition smaller thrombi are freed and are caught in the capillaries and collateral vessels. When the smaller thrombi lodge in the lungs they cause sharp pains in the side, which may be followed by pleurisy, pneumonia, bronchitis, or an infarct. When thrombosis is suspected prophylaxis should consist of absolute rest in bed and careful nursing, together with the bandaging of the affected extremities.

**On the Seropathy of Puerperal Fever.** In an address to the Berlin Medical Society Bumm<sup>2</sup> said that the influence of antiseptic treatment upon

<sup>1</sup> Archiv. f. Gynäkol., vol. lxxiv., No. 1.

<sup>2</sup> Münch. med. Wochen., 1904, No. 25; British Gynecological Journal, November, 1904.

puerperal fever has been less than upon any other form of traumatic infection. It is true that in hospitals, formerly its breeding places, puerperal fever is now reduced to a minimum, but in general practice, in which far more cases occur than in hospital, the influence cannot be seen. As many women die yearly now in Prussia alone from puerperal fever as in the days before antiseptics. The general mortality is less in large cities than in the country districts. The difficulty with midwives regarding disinfection lies in the impossibility of carrying out disinfection in a private house and in the necessity of their undertaking the more menial details of nursing whereby they were constantly contaminated afresh. It cannot be expected that we shall have any improvement in the prophylaxis of puerperal fever with the present system of antiseptics. Such improvement can only be attained by parturients being taken into institutions for childbirth instead of being confined at home. For the present, then, it should be our constant duty to contend against puerperal fever; and since all means of doing so hitherto at our disposal have proved insufficient; since local antiseptics is not efficient in sepsis, but only in decomposing processes; since surgical measures such as extirpation of the uterus, curetting, or according to the last French fashion, brushing out the uterus, have proved harmful, one must welcome the attempt to strike at the root of the evil by the help of serotherapy. One would have thought that the past ten years might have brought some unanimity as to the value of serotherapy; that this has not been the case depends upon the enormous variability of puerperal fever, the prognosis of which is so hard to estimate in individual cases. In the worst kind of general sepsis the prognosis is not doubtful; nor, on the other hand, is it so in those of local infection. Between these two forms lie the vast majority of the cases, those in which the temperature once or twice exhibits an elevation accompanied by rigors, and which, like the localized processes, generally (in 70 per cent.) recover of themselves; and if in such cases serotherapy were employed that recovery would too often be attributed to the serum. One can hardly be skeptical enough in giving credit of this kind—a point to be taken to heart in regard to the serotherapy of diphtheria, scarlet fever, rheumatism, etc., also.

The true appreciation of the action of the serum is further obscured by the differences in the quality of the sera applied. Bumm has tried them all, but the majority of his experiments were based upon Aronsohn's. In appreciating the results no comparison of statistics would be employed, for statistics were misleading. For instance, if all the cases of one-day fever were injected they would yield 100 per cent. of cure. He considers it better to divide the cases of puerperal fever into sub-classes and consider each of these independently. His divisions are as follows:

1. Peritonitis puerperalis septica: 5 cases; all treated with large doses of serum; all fatal, and none betraying any influence upon the temperature or upon the presence or abundance of streptococci in the blood.

2. Operative peritonitis following serious obstetric operations: mixed infections, 4 cases, likewise without effect.

3. True septicæmia: 3 cases; in 2, in which the blood of the cadaver was overloaded with streptococci, there was no effect; in the third the temperature was three times promptly reduced by the injection of serum, and the case recovered under the formation of a thrombophlebitis of the right leg.

4. Septic endocarditis: 3 cases, treated without effect. In one instance the serum was injected intravenously and appeared to be detrimental.

5. True pyæmia (thrombophlebitis purulenta): 3 cases were treated without effect. Intravenous injection seemed to be detrimental.

6. Parametritis and perimetritis, as localized processes which the natural forces can cure, were expressly excluded from the experiments.

7. Endometritis (the chief group); 53 cases were treated, of which a number were mild; 32 were severe. The blood was examined in 17 and streptococci were found in 12; 5 were fatal. The serum injection had no effect in 7, but in 21 the clinical aspect and temperature curve showed without doubt that it had. Bumm was therefore convinced of the favorable action of serum injections in such localized affections. He had, moreover, found additional objective evidence in the condition of the lochial secretion.

In the lochia from an infected uterus the streptococci are found in long chains *between* the pus corpuscles, but under the favorable action of the serum a change, often a critical one, takes place, and the chains become shorter and are found *inside* the leukocytes. This phagocytosis signifies that under the influence of the serum the organism has again been fitted for the task which, in cases of spontaneous recovery, it is capable of and performs. In 8 cases examined upon this point phagocytosis was established within twelve hours after the injection.

The serum as it is presented to us to-day is therefore inefficient in serious cases; yet as—except when injection is intravenous—it does no harm it should be given further trial. He has seen two abscesses occur, in each case in connection with the serum used, which was not clear and transparent. In localized processes seropathy is to be recommended unconditionally, since in a large number of cases it was beneficial; when the uterus contained streptococci and membranous exudation, serum was especially desirable, but it was of no use except in large doses.

Bumm<sup>1</sup> believes that an important step in advance has been taken

<sup>1</sup> Berliner. klin. Wochen., October 31, 1904.

in producing the serum by Tavel's process. In this method the serum is no longer obtained from streptococci that have passed through the bodies of animals. The prophylactic use of the serum was also recommended in cases of serious obstetric operations. As yet the serum has no bactericidal action.

The causes of the failure to attain results by antiseptic methods in labor cases equally as good as those obtained in other operations are reviewed by the same author. He thinks that the general treatment employed in cases of puerperal infection is insufficient and that further efforts should be made to develop a satisfactory antistreptococcus serum.

Notwithstanding its shortcomings the writer has held to the serum method of treatment for the past ten years with extremely favorable results. He has used various sera, including Marmorek's, Merck's, Tavel's, Menzer's, and Aronson's. Clinically he divides septic infection into the following classes: 1. The localized streptococcic endometritis, due to infection of puerperal wounds of the vagina and perineum. 2. Those cases due to an extension of an infection along the mucous membranes into the tubes, leading to a septic salpingo-oöphoritis and pelvic peritonitis. 3. Those due to the extension of the infection into the broad ligament, causing septic parametritis. 4. Those due to an extension of the infection over the entire peritoneum, septic puerperal peritonitis. 5. Those due to the extension of the infection from the placental site through the venous channels, leading to phlegmasia, pyæmia, endocarditis, or septicæmia.

The writer treated 53 cases, divided according to this classification, with serum injections, with a mortality of 11 per cent. He says the latter figure, however, is not conclusive, as about 80 per cent. of women with a streptococcic infection eventually get well. The value of the treatment lies in the fact that a more serious class of cases have recovered than would have been the case with other treatments. The writer admits that at present we have no serum which exerts any effect on tissues which have been invaded by streptococci beyond the point of original entrance. Where a general peritonitis, parametritis, pyæmia, or endocarditis has developed, the use of the serum is ineffectual and useless. On the other hand, when the infection remains localized in the endometrium, or where the streptococci are circulating in the blood in moderate numbers without having produced any lesions in other organs, the employment of the serum will serve to overcome the infection and its use should be recommended. The comparative harmlessness of the subcutaneous injection of the serum has led the writer to employ it as a prophylactic measure whenever the labor has been severe, the placenta adherent, requiring removal, the liquor amnii decomposed, or fever present during labor. He believes that many infections may

be avoided and many rendered less violent by this measure. Aronson's sera he believes to be the best.

**Bloody Milk during the Puerperium.** A rare case is reported by Bouchacourt and Jannin,<sup>1</sup> and they have been unable to find in the literature any record of a similar one. The patient was a primipara aged twenty years. When she was delivered it was noticed that she had a chocolate-colored secretion in both breasts. This she stated had been going on for about ten days. Three days after delivery an examination was made of the secretion under the microscope. It contained blood and a large number of micro-organisms of various sorts. The staphylococcus aureus and the colon bacillus were recognized. The secretion continued of the same character until the seventh day. It was very abundant and at this time pain and swelling with some fever developed in the breasts. Pus could be squeezed from the breasts and the attack developed into a double galactophoritis. The cause of the hemorrhage could not be discovered.

**The Morbidity of the Puerperal State in Cases Complicated by the Birth of a Macerated Fetus.** A compilation and study of the statistics of this condition has been made by Kothen.<sup>2</sup> He has collected 358 cases of labor which were complicated by the death and maceration of the fetus. In a series of 34 of the cases there was some complication during the puerperal period, and a morbidity of about 10 per cent. was observed. Another series consisting of 274 cases showed 157 normal recoveries. In these cases which recovered there was considerable decomposition of the fetus; the morbidity was considered to be due to outside infection during the conduct of the labor rather than to the death of the fetus. Klein made an extract from the tissues and organs of a fetus which died about fourteen days before birth and injected it into animals. Two died from the results of the injection. The symptoms exhibited by these animals were those of toxæmia. The material was proven by culture to be free from bacteria.

In Kothen's own cases, which were reported from the clinic at Giessen, fever was considered present when the temperature rose above 99.5° at any time. In 14 of these cases, or 20 per cent., there was fever. In 27.1 per cent. there was some abnormality following the delivery of a macerated fetus. In no instance was the death of the mother traceable to a macerated and dead fetus. The writer's conclusion was that the complication of a dead and macerated fetus gives an additional morbidity of 10 or 11 per cent. to that of the ordinary morbidity of labor and the puerperal state.

<sup>1</sup> Bull. de la Soc. d'obstet. de Paris, June 16, 1904; Journal of Obstetrics and Gynecology of the British Empire, January, 1905.

<sup>2</sup> Archiv f. Gynäkol., Band lxx., Heft 3, 1903.

**Stypticin for the Bleeding of Subinvolution.** H. J. Boldt<sup>1</sup> has used this drug (cotarnine hydrochlorate) for various forms of uterine bleeding, and refers to its use in postpuerperal bleeding after careful removal of the placental or decidual remnants. In no instance of slight bleeding during pregnancy in which it was administered did uterine contractions follow, and the bleeding usually ceased. The average dose is  $2\frac{1}{2}$  grains every two to three hours. I have used this drug for cases of prolongation or early recurrence of the bloody lochia in cases where no foreign material remained in the uterus, and with few exceptions it has been most efficient. I have found the following combination of especial value:

R—Ergotin	.	.	.	.	.	.	.	gr. j.
Extract hydrastis	.	.	.	.	.	.	.	gr. v.
Cotarnine hydrochlorate	.	.	.	.	.	.	.	gr. iiss.

This, the amount of one dose, is given in two capsules three or four times daily.

**The Bladder and its Disorders during the Puerperal Period.** An interesting paper on this subject has been contributed by Ruge.<sup>2</sup> Formerly writers have generally ascribed bladder disturbances after labor to overdistention; some have attributed it to abdominal pressure and have bestowed undue importance upon the theory. Ruge has been led to believe through his investigations that the mechanism of all cases of labor taking place through the vagina causes strong pressure to be brought to bear upon the bladder at the neck and at the trigonum, thereby causing lesions which produce characteristic results. The longer the labor, the greater the pressure and the greater the danger of injury to the bladder. The proportion in size between the fetal head and pelvis, the time that the head is in the pelvis, and especially the period that the head remains upon the pelvic floor are important factors. The production of the characteristic lesion known as bullous oedema is attributed to the anatomical formation of the bladder. Cystoscopic examination reveals areas of darkened, swollen mucous membrane, which persist for from four to six weeks after labor. Hemorrhages may also be discovered in the bladder in the area from the sphincter to the posterior wall. The hemorrhage lies beneath the epithelium and is found spread out in various-shaped areas. During recovery there is a gradual change in color back to the normal.

The writer finds that these lesions of the bladder are not confined to those cases delivered by forceps or other difficult obstetric operations. They were found in cases where pelvic contraction was absent. In cases where the injuries were slight, no symptoms were present; where the injuries were severe, there was retention of urine or painful micturi-

<sup>1</sup> New York and Philadelphia Medical Journal, February 25, 1905

<sup>2</sup> Monats. f. Geburts. u. Gynäkol., 1904, Band xx.

tion. Changes in the urine were noted and were dependent upon the changes in the mucous membrane of the bladder. Special care is urged in using the catheter in these cases on account of the great liability to transfer infection to the raw surfaces. Injuries of a similar character to those described in the bladder were found in the ureters and urethra.

**Gastrointestinal Hemorrhages of the Newborn.** False melæna may be due to bleeding from the mother's nipples during nursing, swallowing of blood during labor, excoriations from the child's mouth caused by breech extractions, and operative division of a frænum for tongue tie. These conditions must be recognized and distinguished from true melæna, says Lop.<sup>1</sup> True melæna is most often due to syphilis, and even in the absence of a family history or of physical evidences of that disease it should be treated as such. The resulting anæmia is always a serious condition if death does not occur at once, and the prognosis should be very guarded. The immediate treatment consists of hot applications, cutaneous friction, the incubator, boiled water by the mouth in liberal quantities instead of milk, and rectal injections of normal saline solution night and morning, to which a little brandy has been added. Ergot and chloride of iron may be given, but the author prefers calcium chloride in doses of  $\frac{1}{2}$  to 2 grams a day. Along with this an active antisiphilitic treatment should also be instituted.

### OBSTETRIC SURGERY.

**Artificial Dilatation of the Cervix in Obstetrics.** Among the pre-eminent practical advances in surgical obstetrics none within the past few years has occasioned greater discussion and difference of opinion than the indications for, and the relative value of, the method of opening the cervix of the pregnant womb in order to terminate pregnancy or labor. For that reason this subject will be discussed at length. I<sup>2</sup> consider skilful, relatively rapid dilatation of the cervix an assured means of preventing many disastrous complications, although there are those who condemn it as meddlesome and dangerous, and liable to be followed by serious results.

To appreciate the problem of obstetric dilatation of the cervix, and to estimate the practical value of any method employed for that purpose, we should study nature's method of dilatation. The longitudinal fibres of the uterus exert a direct pull upward of the lower segment, and assisted by the downward push of the hydrostatic pressure of the

<sup>1</sup> Presse médicale, September 21, 1904; American Journal of Obstetrics, March, 1905.

<sup>2</sup> American Medicine, May 20, 1905.



bag of waters, and later of the presenting part of the fetus, the lower segment is dilated, the internal os is opened and drawn upward, and the cervix is thus attenuated and effaced, the dilatation being the final stage of the process.

Thus the value of any method of artificial dilatation, gradual or rapid, should be measured by its power to evoke uterine contractions and thus assist the upward pull which promotes effacement of the internal os. The methods for either slow or rapid dilatation of the cervix and emptying of the uterus which are employed are as follows: 1. The flexible bougie. 2. The hydrostatic bag. 3. The bougie and bag, with preliminary partial mechanical dilatation. 4. Manual dilatation (the methods of Harris, of Bonnaire, and Edgar). 5. Branched steel dilators (Bossi's and its various modifications). 6. Dührssen's vaginal Cæsarean section.

*Dilatation when Rapid Delivery is Unnecessary.* My experience with flexible bougies has taught me that, while efficient in promoting contractions and softening the cervix, their action is often slow and tedious. The hydrostatic bag also evokes contractions and hastens physiological dilatation, but it alone will sometimes fail to irritate the uterus. Hence I have been induced in the last few years to combine all three methods, and all the cases indicating the relatively slow induction of labor have been invariably treated by this combined method with most satisfactory results. After a soap-and-water toilet of the vulva, vaginal entrance, perineum, and anal region, followed by a mercuric bichloride douche (1: 2000) of the external genitals, the cervix is caught in a double tenaculum; the canal, if required, is digitally or instrumentally dilated to the size of the index finger; an instrument combining a branched dilator and bag introducer is inserted into the cervix, taking care not to rupture the membranes. The entire length of the cervix is dilated to from 5 to 7 cm., the degree sufficient to admit the bag and indicated on the instrument. The index finger passed between the expanded blades, notes the degree of tension at the internal os, and can be used to assist the dilatation, acting as a third blade alternately stretching the anterior and posterior margins of the os internum. A hollow bougie (Delamotte, No. 23) containing a stylet, having the curve of a prostatic catheter, sterilized by boiling, is now inserted, the stylet being gradually withdrawn from that portion of the bougie which is entering the uterus. By this manœuvre the tip of the bougie is made to hug the anterior uterine wall, thus avoiding puncturing the amniotic sac, and the bougie from the internal os outward, being kept rigid by the stylet, ensures an upward and onward course of the tip of the bougie toward the fundus. It also prevents the coiling of the bougie at the internal os, which otherwise often occurs and prevents the prompt insti-

tution of uterine contractions. When the bougie has been introduced at least ten inches into the uterus, a bag of the Voorhees pattern, but having a capacity (600 c.c.) three times as great as the largest size for sale in the shops, is rolled into the smallest possible roll, caught in the instrument previously used as a dilator, but now used as a convenient forceps for placing the bag, and is gently carried into the dilated cervix; the forceps is opened and removed and the bag is distended with 480 c.c. of sterile water by means of a metal syringe whose piston rod is graduated in cubic centimetres. This bag incompletely filled adapts its upper segment to the shape and position of the presenting part without tending to displace the latter, and upon the occurrence of a uterine contraction the lower segment of the bag is gradually distended in the cervix to the size of the largest Voorhees bag. After the bougie and bag have been introduced, the vagina is packed through a bivalve speculum with gauze. The operation takes about twenty minutes and is ordinarily done without an anæsthetic. For a very nervous and apprehensive patient a few whiffs of ethyl chloride or chloroform may be used during the dilatation of the cervix. This large and incompletely filled bag more nearly resembles in function the natural bag of waters than any artificial aid we can employ.

When dilatation is inordinately slow, continuous, or intermittent traction should be made on the stem of the bag. This traction, to be most efficacious and least dangerous, should be made with recurring pains, since during the pains the cervix is drawn upward by the action of the uterus and effacement of the cervix is then materially assisted by the bag. Continuous traction by a tape and weight has some danger of tearing the lower segment of the uterus, but may be avoided by releasing the weight at intervals of half an hour, and never using a weight exceeding three pounds. When the bag distended by 480 c.c. of water can be drawn through the external os by firm and steady traction, the cervix will be dilated to 9 cm., and the termination of labor may be left to nature, or when rapid delivery is indicated forceps or version may immediately follow. After the bag has been removed, especially if the membranes have ruptured, an examination should always be made to note the occurrence of prolapse of the cord or of fetal extremities, accidents that rarely follow but require immediate replacement, reinserting the bag if necessary to retain the prolapsed cord in the uterus. Another important use of the bag is to hasten a slow first stage of labor, before or after the rupture of the membranes; this is especially true of occipito-posterior positions arrested at the brim of the pelvis by incomplete flexion. In many such cases I have shortened the patient's suffering and have saved infants' lives by preventing prolonged labor and inevitable asphyxia. It is also valuable as a tampon for the cervix in

lateral and marginal placenta prævia, and after replacing a prolapsed cord it has proved a convenient means to keep the cord within the uterus during the stage of dilatation. The average time required for the completion of labor by means of the bougie and bag alone in 35 cases of induced labor for the lesser degrees of pelvic contraction in my practice, including the cases of spontaneous delivery, as well as those terminated by forceps or version, was twenty-nine and one-half hours. For other complications, such as toxæmia of pregnancy; grave cardiac, kidney, and pulmonary diseases; pernicious nausea and vomiting, chorea, prolongation of pregnancy, etc., I find that in 52 such cases of induced labor the average time required for the completion of labor was thirty-four hours. In this group of cases there is of course a larger proportion of labors terminated spontaneously.

Since I have used the method in which the introduction of the bougie and bag has been preceded by partial instrumental dilatation of the cervix, the average duration of labor in 18 cases terminated by forceps or version has been seven and one-half hours; in cases of spontaneous delivery, sixteen and one-half hours. These latter figures contrasted with the bougie-bag method show a diminution of twelve and one-half hours in the duration of spontaneous labors and of five and one-half hours in labors terminated by version or forceps. Measured then by the standard of relatively quick delivery, by its physiological effacement and dilatation of the cervix and by the absence of lacerations associated with rapid and complete mechanical or manual methods, the method I have described has been most satisfactory. For cases not requiring *accouchement forcé*, an operation whose indications become less frequent, the wider my obstetric experience grows the method I have described reinforces what past experience has taught us is a safe method by adding thereto partial mechanical dilatation to a degree that is free from the danger of lacerations, and which diminishes the uncertainty and delay of the method of the bougie and bag.

In late years there has been a growing tendency to depart from the slower methods of terminating pregnancy and the first stage of labor. The indications for rapid surgical interference have widened until it would appear that there is danger of the slower and safer methods being laid aside. Of the rapid methods of opening the cervix, the ones now most discussed and most likely to find a permanent place are rapid dilatation by one of the metal dilators and Dührssen's vaginal hysterotomy. For my own part I am convinced that these methods will find a place of assured value, but that their proper indication and employment will always require most discriminating obstetric judgment. Eclampsia and placenta prævia are without doubt the most frequent affections now subjected to one or the other of these operations. That cases do

occur demanding delivery in from five to thirty minutes is beyond question, but they are certainly rare, and the injudicious application of Bossi's dilator or Dührssen's operation to many or all cases of convulsions or of hemorrhage due to placenta prævia can only cast discredit upon obstetric surgery.

My experience with more than 100 cases of *eclampsia* has taught me that the most rapid delivery is by no means a *sine qua non* of successful treatment. With eliminative treatment well under way, and showing no effect upon repeated and violent convulsions in a patient whose toxæmia has apparently not produced the gravest structural changes in the kidneys, but has overwhelmed the nerve centres, in such a case, with an undilated and rigid cervix, I believe the proper obstetric treatment is to choose between Bossi's and Dührssen's methods. In this choice the character of the cervix to be dealt with, more than its degree of dilatation, and the state of the patient, are the most important factors. Thus, when the cervix is tough, elongated, and uneffaced, or scarred with dense cicatrices, Bossi's dilator is a dangerous instrument even in the hands of an experienced operator, for no matter how trained is his "mechanical sense," extensive lacerations do occur in such cases without warning, even with a finger in the cervix to note and estimate the danger line of tension, and shock and hemorrhage are instantly added to the burden under which the patient is sinking. To one who hopes to attain the skill necessary to use the Bossi dilator with success, Dührssen's vaginal section will be equally well acquired. It is quicker, accompanied by no greater shock, traction by an assistant upon the cut edges of the incision controls hemorrhage, and the most difficult part of the operation, the introduction of stitches, is not difficult with assistants, a good light, large vaginal retractors, and vaginal incisions if required.

On the contrary, when we find the cervix partially effaced, softened, yielding, and therefore dilatable, Bossi's dilator has distinct advantages, and especially under the environment of obstetric practice outside of hospitals. Too rapid dilatation with this instrument under any circumstances is hazardous, never less than thirty minutes being devoted to a dilatation of 11 cm. The dilatation should be advanced with greater slowness and caution after passing the 8 cm. mark, for the lacerations are most likely to occur toward the end of dilatation, when the tissues are thinned to their utmost. A grave defect in Bossi's instrument, namely, its liability to gouge and lacerate the posterior wall of the cervix, has been overcome theoretically in the modification devised by de Seigneux; the blades of this instrument have practically a pelvic curve and vary in size, affording a broader surface in contact with the dilating cervical structures. Drawing the cervix down with a tenaculum and thus sharply anteflexing it, so often necessary to introduce the Bossi instrument,

can be dispensed with in using De Seigneux's. From the standpoint of quick delivery after dilatation, the dilator is inferior to Dührssen's vaginal section, because version after the former is likely to find the cervix somewhat recontracted after removal of the instrument, and the passage of the after-coming head may produce lacerations wholly beyond one's control. The more rapid the dilatation the greater is this tendency to contraction. After Dührssen's section the upper angle of the incisions may be guarded by suture before turning the child. Whenever possible, therefore, forceps delivery is to be preferred to version after using the Bossi dilator, because the degree of tension can be more readily observed and sufficient time may be taken in the delivery of the head through the cervix to prevent such lacerations that is out of the question in a head-last delivery. The more recent methods of Bossi and Dührssen discount the methods of rapid manual dilatation of Harris, Edgar, and Bonnaire.

As I have stated, my experience is against forcible delivery in the vast majority of eclamptic cases. Reviewing these three methods of delivery as they may be related to the treatment of *placenta prævia*, it is my conviction that Bossi's instrument and Dührssen's hysterotomy have even a more restricted field than in eclampsia. The degree of hemorrhage, the variety of placenta prævia, and the state of the cervix largely determine the treatment. Moderate hemorrhage is usually associated with lateral implantation, and when the placenta invades a small area of the lower uterine segment, bag dilatation, followed by a forceps delivery, if necessary, is efficient. The large bag inside the ruptured amnion and traction sufficient to control bleeding should be used until the cervix is opened enough to apply forceps. More extensive invasion of the dilating segment of the uterus by the placenta and more profuse hemorrhage may be successfully treated by partial metallic dilatation, the large bag followed later by version with slow extraction to avoid laceration and serious hemorrhage after delivery. Central or marginal implantation, with rigid cervix, profuse hemorrhage, and a mature and living child—a combination of conditions I have yet to observe—is the only class of cases for which *accouchement forcé* should be considered. With such a case I should perform Dührssen's hysterotomy, for I believe it meets the indications more rationally than any plan of treatment heretofore proposed. Rapid separation of the bladder, incision of the cervix and the anterior uterine wall with scissors to the limit of the separation, pushing aside, or perforating if necessary, the obstructing portion of the placenta, and a rapid version and extraction of infant and placenta, followed at once by a firm tamponade from fundus to vagina, temporarily clamping the bases of the broad ligaments if the hemorrhage is profuse, and then diminishing the volume

of the tampon for the proper introduction of sutures, appeal to my surgical and obstetric judgment.

CONCLUSIONS. 1. The necessity for the induction of a premature labor by a method requiring less than twelve hours is extremely rare.

2. The method most frequently employed, and most satisfactory in my experience, has been a combination of partial mechanical dilatation, followed immediately by the insertion of a bougie and an extraordinarily large Voorhees bag incompletely filled.

3. For the relatively rare cases in pregnancy or labor requiring *accouchement forcé*, the choice of rapid mechanical dilatation depends especially upon the character of the cervix, the general state of the patient, and the firm determination not to attempt too rapid dilatation. Bossi's or De Seigneux's instrument is cleaner, less tiresome, applicable to the same class of cases, and is not more dangerous than manual forcible dilatation.

4. Dührssen's vaginal section is a most valuable operation in the hands of an expert obstetric surgeon, and should be preferred to too rapid metallic dilatation, except when conditions favorable to the latter are unmistakably present.

5. For the treatment of the gravest form of placenta prævia and of accidental hemorrhage, Dührssen's hysterotomy in the hands of an expert vaginal operator should prove the best method of treatment ever offered.

**Rapid Mechanical Dilatation of the Cervix in Obstetrics.** A critical review of the means and methods employed in this operation is submitted by Fothergill.<sup>1</sup> There has always been a prejudice against the use of instruments for this purpose, and very little has been written about the earlier attempts to introduce them. The human hand was the first approved means of mechanical dilatation; this was followed by the introduction of elastic and non-elastic hydrostatic dilators. The mechanical dilator obtained but little notice until about 1890, when Bossi described his three-pronged instrument. It met with only moderate success until 1901, when Leopold saw the inventor operate with his improved four-pronged model. Leopold used the instrument and endorsed the claims made for it: 1. That it can be used even when the cervix is closed and as yet unshortened. 2. That the operator is sure of obtaining sufficient dilatation to allow of the delivery of a living child. 3. That this can be secured, if necessary, in from fifteen to twenty minutes. 4. That the use of the instrument excites uterine action, even in the cases of uterine inertia. 5. That dilatation up to 11 cm. can be secured without unduly distending the vagina.

<sup>1</sup> Journal of Obstetrics and Gynecology of the British Empire, October, 1904.

Lederer and Keller were favorably impressed with the instrument in their clinics, but Keller regarded it as an instrument to be used only by those practitioners specially experienced in obstetric work, as it might be dangerous in the hands of a beginner. Its special value he considered was in the treatment of eclampsia. Dührssen declared emphatically that it was not to be regarded as an advance in operative midwifery; he said that (1) the instrument did not always enable the operator to secure enough dilatation for the delivery of a living child, (2) that the operator was not able to control the process, and (3) that the method was positively dangerous, some of the tears produced being followed by bleeding and some becoming infected. Dührssen thought that the favorable results obtained by Leopold and others could have been obtained by hydrostatic dilators or by multiple incisions of the cervix, while the less favorable cases could have been treated better by incisions or by vaginal Cæsarean section. Bossi replied vigorously by stigmatizing Dührssen as illogical and unscientific in criticising a method he had never tried. He stated that in his own work at least there had been no difficulty in securing adequate dilatation; that by keeping a finger upon the cervix control of the operation had always been satisfactory; that tearing and hemorrhage had been very rare, and that infection was more easily prevented with this than other methods. Bossi had found that incisions of the cervix as recommended by Dührssen, besides causing hemorrhage, were often extended by tearing during the extraction of the fetus, and that such tears often involved the body of the uterus and were alone sufficient to bring about fatal results. The use of cervical incisions could only be justified so long as there was no other method which answered the following demands: (a) certain and sufficient dilatation to allow of the delivery of a living child; (b) rapidity in securing this degree of dilatation—ten minutes and upward; (c) power of exciting uterine action accompanying dilatation. Bossi's method fulfilled all these requirements, and he declared that cervical incisions and, even more so, vaginal Cæsarean section remained merely as historical remembrances; the time for their use was past and gone.

Von Bardeleben, after using the dilators in ten cases, reported that the value of the metallic dilator as a stimulant to uterine action is very small; much inferior to the non-elastic bags of Champetier de Ribes and others; hence they are, in any case, either unnecessary or undesirable. When a cervix can be dilated, the means most closely resembling the natural process, the inelastic bags, should be used; when it cannot be dilated, it should be cut as advised by Dührssen rather than torn open by Bossi's dilator.

On the contrary, many reliable authorities continue to find metallic dilators of the Bossi type useful and apparently harmless when care-

fully used in suitable cases. De Seigneux has recently produced a modification of the Bossi type in that his instrument is constructed with a true pelvic curve; it is less heavy and complicated, and the dilating surface of the blades is larger. He says that the plane in which the points of the blades move must be parallel with the plane of the inlet of the true pelvis if the blades are to act evenly and truly upon the cervix, whose axis is approximately perpendicular to the plane of the brim. In instruments of the Bossi type it is impossible to bring the prongs into the real pelvic axis, and to this cause, says De Seigneux, the bulk of the tears which occur are due.

In using the dilators an anæsthetic should be used. The instrument should be inserted into the cervix without the aid of a speculum or vulsellum. Any difficulty encountered in instruments of the Bossi type is due to a lack of a true pelvic curve. De Seigneux claims that his type does away with all these, as with the risk of boring and digging injuries of the cervical wall. The dilatation should be as gradual as is compatible with the safety of the mother and child.

Dilatation should be slower and slower as it progresses, as tearing becomes more and more likely as the process nears completion. A frequent if not constant examination of the cervix should take place by a palpating finger passed between two prongs. The average of the time recorded as occupied in dilating the cervix seems to be growing longer as experience is accumulated. Dilatation should be carried farther than the degree absolutely necessary because the rapidly dilated cervix contracts very quickly. The more rapid the dilatation the more rapid is the subsequent contraction. One should preferably deliver by forceps rather than by turning.

The rupture of the bag of waters during the dilatation is a common and unavoidable occurrence. Trouble is sometimes experienced when the presenting part is driven between the prongs, as the instrument cannot be withdrawn unclosed without injury to the mother, and it cannot be closed without injury to the child. De Seigneux's instrument avoids this complication, for, after removing the handle, the blades can be removed one by one.

Before using any instrument the markings on the scale should be verified by comparing them directly with the space as measured by a tape between the prongs. It is recommended by some writers that the prongs be covered with pieces of rubber drainage tubes to afford additional security to the cervix. Leopold gives the following indications for the use of the metal dilators: 1. Induction of premature labor and acceleration of labor induced by other means. 2. *Accouchement forcé* including eclampsia, heart disease, phthisis, and other disease, putrefying fetus, threatened death of the fetus, placenta prævia, anatomical stenosis



of the cervix, cicatricial stenosis of the cervix. 3. Retained placenta with contracted cervix. The writer does not consider it likely that this instrument will ever be much used for inducing labor as opposed to accelerating labor induced by other means. In placenta prævia there is a pronounced difference of opinion as to its use, with apparently the decision against it. In anatomical and cicatricial stenosis of the cervix the metal dilators are seen at their worst. When the metal dilators are admissible in any case, the state of the cervix and the state of the patient, rather than the nature of the case which makes their use desirable, are the points to consider.

The operator will only have to choose between dilatation and multiple incision in those cases in which rapidity is the main object. The state of the patient is first to be considered. If delivery within a few minutes is demanded by the interest of the mother or child, the next point to consider is the state of the cervix. The state of the tissues is the guide here rather than the size of the os. If the operator judges the cervix to be softened enough to admit of complete dilatation within a few minutes, he will dilate, otherwise incise. Neither fingers nor bags will compete with metallic dilators when extreme rapidity is required. It is perfectly easy to tear the cervix and infect the uterus either with the fingers or with bags. Considering that on account of the perishable nature of "rubber goods" very few practitioners keep hydrostatic dilators in a state ready for use, and that dilating with the fingers is a most painful and tiring process for the operator, and that fingers are not so easily sterilizable as metal, it would appear that in the fairly common cases in which some assistance in the first stage of labor would be desirable, could it be given safely and easily, there will be a field for the use of the metal dilators.

**The Relative Value of the Means and Methods Employed in Accouchement Force.** There is still a wide difference of opinion existing among authors and teachers regarding the relative value of the various methods employed to empty the pregnant uterus by force at any time from the fifth to the ninth month of gestation. Zinke<sup>1</sup> considers this a sufficient reason for discussing the subject again. There are two distinct classes of *accouchement forcé*: (a) the rapid and (b) the slow method of delivery. The rapid class represents those cases in which the condition of the mother, and sometimes that of the child, demands a prompt and rapid termination of the pregnancy. The other class comprises those cases which may be delivered slowly because of the absence of immediate danger to the mother and the existence of a justifiable disregard of the life of the fetus. The time consumed in the first class varies from a

<sup>1</sup> American Journal of Obstetrics, November, 1904.

few minutes to an hour; in the second class the time consumed may be twelve, twenty-four, or more hours. The methods discussed are: 1. The graduated steel or vulcanite dilators and the branched or bladed dilators. 2. The bag or hydrostatic dilators. 3. The manual dilatation of Harris and the bimanual dilatation of Bonnaire and Edgar. 4. The superficial and deep cervical incisions and Dührssen's vaginal Cæsarean section. 5. The conservative Cæsarean section. 6. Bossi's and similar metal dilators.

The graduated steel dilators of division 1 are only used to partially open an unobliterated cervix or rigid os preparatory to digital, manual, or bag dilatation. The bag or hydrostatic dilators are regarded by many obstetric authorities as the best, safest, and most natural method of hystereuryisis for *accouchement forcé*. The writer considers it by no means applicable in all cases, nor devoid of danger. Bag dilatation he considers is indicated mainly when the mother's condition is good or nearly so, when time is not an important element as to the safety of either the mother or child, and when uterine hemorrhage proceeds from a lateral or marginal placenta prævia rather than from a central implantation. In the latter form the child's life is at once sacrificed and the mother's life is seldom saved when bag dilatation is the method of forced delivery. In eclampsia it is doubtful whether the use of the bag is advantageous, unless it be to hasten a labor already begun. Hystereuryisis has a tendency to increase the number and duration of the eclamptic attacks.

The use of the bag is the best means of dilatation in premature rupture of membranes, uterine atony, malpositions of the fetus, either before or immediately after rupture of the amniotic sac, when dilatation of the os is slow and irregular, in prolapsus of the cord, prolapsus of the feet, and especially in the lateral and marginal varieties of placenta prævia. Some of the objections urged against bag dilatation are that thinning and attenuation of the cervix do not take place when it is used; if traction is added the cervix is drawn down and not up as in natural labor. Prolonged or undue traction upon the bag endangers the rupturing of the lower uterine segment and the danger of sepsis can never be entirely excluded. Lacerations may occur in introducing it and displacements of the fetal parts with immediate prolapse on removing it have occurred. Contraindications to bag dilatation are: 1. When the head occupies the pelvic cavity. 2. When sepsis is present in the vagina. 3. Placenta prævia centralis. 4. When the cervix is hard, uneffaced, and the canal closed. There are strong objections to the Harris and Edgar-Bonnaire methods of dilatation. Shock, lacerations, hemorrhage, and sepsis are not infrequent complications even in cases well suited to this method. Neither method should be adopted unless

the cervix is completely or nearly effaced, and the os patulous and readily dilatable. While manual and bimanual dilatation are justifiable procedures under circumstances favorable to their execution, it is pertinent to remark that the life of the child, as a rule, and that of the mother, occasionally, is sacrificed under these two methods.

*The Superficial and Deep Cervical Incisions and Dührssen's Vaginal Cæsarean Section.* Dührssen's operation is indicated when the cervix is hard and intact; when there is marked elongation of the portia vaginalis; when the cervix is the site of extensive and unyielding cicatrices or of malignant disease. Cervical incisions are recommended in *conglutinatiō orificiī externī*, in premature rupture of the membranes, generally contracted pelves, eclampsia, heart disease, articulo mortis, threatened rupture of the uterus, placenta præviæ, ablatio placentæ, etc. The dangers of sepsis, hemorrhage, and laceration are urged against these operations, but they are not well taken, as the same is true of any of the methods resorted to in *accouchement forcé*. The conservative Cæsarean section for *accouchement forcé*, as yet, is challenged by a large proportion of obstetricians and general practitioners. The writer believes that "if after due reflection and consideration it is impossible to save both mother and child, save the mother." The life of many an unfortunate mother has been lost by not disregarding the interest of the child about to be born. Many cases can be cited where the death of pregnant women was due to persistent, vain, and fruitless, though heroic and sanctioned, efforts to deliver them of their offspring, dead or alive, *per vias naturales*. The argument against this operation that obstetricians and general practitioners are more familiar with the use of the tampon, bag, manual, and metal dilatation, with version, forceps, and embryotomy than with the technique of Cæsarean section, and that it should not be tried until they have failed with any, several, or all of the methods of forced labor, is as unsafe as it is unwise. Cæsarean section for *accouchement forcé* should never be employed unless the child has attained at least the seventh calendar month of gestation and manifests signs of vigor and life. This in the presence of placenta prævia, ablatio placenta, or eclampsia associated with a hard-closed cervix, and perhaps a malpresentation of the child and primiparity would constitute an almost definite indication for this operation.

The Bossi dilator and its competitors are intended for the purpose of displacing deep cervical incisions, and vaginal as well as abdominal hysterotomy. The following metal dilators are considered of value: Bossi's, Frommer's, Kayser's, Krull's, Raineri's, Preiss's, Schwarzenbach's, Müller's, and Knapp's modification of Bossi's dilator. Bossi gives the following indications for the use of his dilator:

1. The cervix may be immediately dilated, whatever the condition

of softening, shortening, or dilatation, to a sufficient extent to extract a fully developed fetus. 2. This dilator should be preferred to Cæsarean section, antemortem as well as postmortem. 3. It is indicated in the induction of premature labor. 4. In grave cases of eclampsia. 5. In cases of heart disease, tuberculosis, dead and putrid fetus. Fieux adds pneumonia, pleurisy, and ascites. 6. When the life of the fetus depends upon rapid extraction. 7. In placenta prævia, anatomical cervical stenosis with undue prolongation of labor. 8. In cicatricial stenosis the instrument should be tried before cervical incisions are made. 9. In cases of incarcerated placenta, the result of uterine tetany. The above indications are supported by Bossi and several other able men since he made his first report. Dührssen prefers the easily performed vaginal Cæsarean section bearing his name. Hartz believes that all such instruments should be relegated to the lumber-room of obstetric instruments. De Lee, Bacon, von Bardeleben, and Ohlshausen believe it a dangerous instrument and not to be recommended. Zinke believes that rapid and complete metal dilatation will never become a popular method and that sooner or later it will be universally condemned.

**The Modified Champetier de Ribes Balloon.** Further results in the use of the modified Champetier de Ribes bag are presented by Voorhees.<sup>1</sup> In explanation of the great increase of operative deliveries in the last few years, especially in the large cities, the writer cites the fact that women nowadays are marrying later. With increasing years the cervix and perineum grow more rigid, the uterine contractions become weaker, and in pregnancy the joints are firmer and become less succulent. The older the woman the larger the child, the harder the bones of its skull, the smaller the fontanelles, and the less separated the sutures. In the second place, the city-bred woman—the hot-house patient—cannot and will not endure pain, and too often after a few hours of labor she simply gives up and the accoucheur has to do the whole thing. To the writer's notion, in a certain class of these cases, there is no measure of more value for starting labor and shortening its duration, thereby relieving much suffering, than the Champetier de Ribes balloon. The bags employed by the writer differ very little from those of Champetier. They are slightly different in size and made stronger in order to withstand the abdominal and uterine contractions, to resist the tension when filled with a fluid, and to permit a certain amount of traction on the tube without rupture. To insert the balloon an anæsthetic is employed only in those cases where a preliminary divulsion or a manual dilatation of the cervix is necessary to get enough room for the insertion of the bag, where the cervix is situated so high that it is very difficult to

<sup>1</sup> American Journal of Obstetrics, January, 1905.

reach, when the patient is very nervous and excitable, or where the vulvar orifice is very narrow and sensitive. A light chloroform narcosis is all that is required, as the time required in the vast majority of cases is only a few minutes. No special introducing forceps or syringe is necessary. It is well to insert the largest-size bag possible at the outset and to remember, in filling the bag with the fluid, to inflate slowly with light traction on the tube so that the head, if presenting, will be displaced as little as possible. The patient is left to nature's efforts unless there is need of haste, when traction is made at regular intervals upon the tube. Successive bags are inserted in cases where great haste is necessary and where pains are few and far between or stop altogether after the first bag is expelled.

Voorhees has previously reported a series of 72 cases out of 2113 deliveries at the Sloane Maternity Hospital. The cases were those in which other methods had been tried and failed. The bags were of advantage in all cases and the field of usefulness of the balloons was more definitely determined.

This second series is reported to emphasize the utility of the bags and the great dependence we place upon them, especially in private practice. The first set were cases occurring in the author's private practice. Here he used it in 39 out of 200 cases. The second set comprise four years' deliveries at the Sloane Maternity Hospital, comprising 4272 cases.

The objections urged against the use of the bags are: 1. That they may rupture the membranes. This rarely happens and makes little difference if they do. The fetus suffers some, but little, as the waters cannot all drain away. If the fluid does escape the dilatation is rapid enough to do little harm. 2. That they may separate the placenta (only in placenta prævia). But the bag either arrests the hemorrhage on being filled or when traction is made on the tube. 3. That they may increase the tension in the interior of the uterus. It is not great and no harm is ever done. It is not painful to the patient and never ruptures or weakens the uterus. 4. That they may displace the presenting part. This is possible, but by slow distention of the bag and by watching the presenting part during the distention we can keep it in place. This accident occurred occasionally in the series reported, but was easily corrected. It is more apt to occur in cases of flat pelvis. 5. That the cord may prolapse. For this to occur the cord must be long or loosely coiled about the neck. This accident has happened a few times, but, as far as Voorhees was able to learn, was not responsible in any of these cases for the baby's death. It occurred once in the first series and was detected too late to save the child. A rule should be made to examine when the bag is expelled to find whether the cord has

prolapsed. If it has occurred the proper management should be instituted at once. 6. Sepsis. The balloons can be boiled, and if the aseptic technique is correct there should be no infection. Although there were a few cases of sepsis reported in this series the author cannot believe that they were due to the use of the balloon.

A *résumé* of the first series is given by Voorhees and also a very careful and exhaustive study of the later and larger series. His conclusions are: 1. That the modified Champetier de Ribes bag is the best artificial hydrostatic dilator of the cervix, because it is most like nature's bag. 2. That the bags are especially effective in dry labors to start pains. 3. Labor, if prolonged and protracted from whatever cause, is hastened and in a large percentage of the cases terminates spontaneously after their use. 4. That the bag has proven to be the best and most reliable method of inducing labor for all indications. 5. In eclampsia and placenta prævia the bag has a field of usefulness which diminishes markedly maternal and fetal mortality.

The Sloane series comprised 4272 cases (September 1, 1899, to September 1, 1903). There were 626 cases of dry labors; bags were employed in 48 of these. The protracted labors numbered 238 cases; bags being employed in 50 of the cases and manual dilatation in 19 cases. Induction of labor was resorted to in 147 cases, bags were employed in 111, a bougie alone in 6, tampon of cervix alone in 1, scarification of vulva in 1, and *accouchement forcé* in 28. The total number of bag cases numbered 209, while the total number of manual dilatation cases was 73.

*Eclampsia.* There were 65 cases: 14 postpartum, 2 spontaneous deliveries. In 6, bags alone were used; in 11, bags were followed by version or forceps, and 31 were delivered by an *accouchement forcé*. Seven of the mothers died—a mortality of 11 per cent. The causes of death were as follows: pulmonary embolus, 1; ruptured uterus, 2; purulent peritonitis, 1; hemorrhage, hepatitis, and toxæmia, 3. Of the children 32 died—a mortality of 49 per cent. Including all cases, 19 of the children were non-viable, giving a true mortality of 29 per cent.

*Placenta prævia* was met with in 61 cases; 7 were delivered normally; in 1 case the membranes ruptured; 4 were delivered by breech extraction, 3 by forceps, 19 by version; in 10, bags were used, and 17 were delivered by *accouchement forcé*. Of the cases of placenta prævia 4 mothers died—a mortality of 6 per cent. Death was caused in 3 from rupture of the uterus, and in 1 from hemorrhage (moribund on admission). Of the children 23 died, giving a mortality of 35 per cent.; as 4 were non-viable, the real mortality was 29 per cent.

In the private series there were 200 cases, and of these 47 were dry labors, bags being employed in 4. The protracted labors numbered 19

cases, bags being used in 4. Induction of labor was employed in 32 cases, the bag being used in 29 and a bougie alone in 3. Placenta prævia occurred in 3 cases; bags were employed in 2 and *accouchement forcé* in 1. The total number of cases in which the bag was employed was 39. The total number of manual dilatations was 15. There were 3 cases of *accouchement forcé*, 1 of eclampsia, 1 of placenta prævia, 1 of protracted labor. Manual dilatation was used lightly in 11 cases.

**Induction of Premature Labor.** The operation of inducing labor, in those cases of contracted pelvis in which it has been found by careful measurements that the woman will be unable to give birth to a child of average size and weight at full term, is coming more in favor since we have learned the good results attained by the more recent method evolved in performing the operation and in the subsequent care of the child. Herman<sup>1</sup> in discussing this subject, says that in those cases of contracted pelvis in which a child of average size cannot be born and in which it can only be born at full term on condition that it is a small one, the alternative lies between the repeated performance of premature delivery and Cæsarean section. Cæsarean section can be combined with the sterilization of the patient, or if that be not done the patient can be advised that the risk will be somewhat less in subsequent sections, because the uterus after Cæsarean section often becomes adherent to the anterior abdominal wall, thus doing away with some of the dangers. The reduction of the risks in this operation is one of the most remarkable accomplishments in the progress of surgery, and it is an operation which should have a very low mortality. In doing a Cæsarean section one deals with healthy parts; you can tell beforehand where everything is situated, and it is the simplest and easiest operation in operative surgery. In cases in which the repeated induction of premature labor would be necessary, Cæsarean section is the best alternative to offer.

There will always be cases in circumstances unfavorable to the successful performance of Cæsarean section, in which, therefore, it will be safer to induce the labor before the child has grown so large as to cause difficulty and danger in delivery. Since the introduction of antiseptics there is no greater risk to the mother in induced premature labor than in labor at full term. The great objection to the induction of premature labor is that the child is born puny and small, and for that reason requires greater attention to rear it than a child born at full term. In rearing a child born prematurely the main indication is to keep it warm. A child born before full term has not the power of producing all the heat it requires. It is not sufficient to wrap it up warmly

<sup>1</sup> Clinical Journal, May 11, 1904.

or to prevent the heat of its body escaping too readily, but additional heat must be applied to it from without. The earlier the pregnancy is terminated, the more need has the child for an artificial supply of heat. Therefore in these cases an incubator should be provided, for a child can be thus prevented from losing heat as well as having it supplied from without. If a child survive the first few weeks it will usually thrive.

THE ULTIMATE RESULTS OF INDUCED LABOR FOR MINOR DEGREES OF PELVIC CONTRACTION. I believe the excellent results obtained by operators for both mother and child in the elective Cæsarean section for minor degrees of pelvic deformity<sup>1</sup> have induced many unnecessary operations for this condition. I am in accord with the teaching which condemns the induction of premature labor on account of the high fetal mortality, with a true conjugate of 7.5 cm. or less in generally contracted pelves, and 7 cm. in the flat pelvis. For conjugates between 10 and 8 cm., however, I believe that the skilful induction of labor at the latest permissible period of pregnancy continues to have its legitimate place. The statistics which have induced some operators to try Cæsarean section all come from foreign clinics. Kleinwächter is cited as stating that following induced labor for pelvic deformity only 78.3 per cent. of the children are born alive, that many die shortly after birth, and only 60.4 per cent. leave the hospital in good condition. Figures like these have caused many operators, especially in this country, to abandon the induction of labor for *any* degree of pelvic narrowing.

Two important factors to be considered in such a poor showing are the termination of the pregnancy at too early a date and a lack of continued care in bringing up prematurely born infants. Statistics of a large number of cases studied by Kronig and Zweifel show that in 504 cases of labor in flattened pelves those with conjugates between 9.5 and 7 cm. required intervention for the contraction alone in less than 9 per cent. of the cases; with conjugates between 8.5 and 7 cm. in 16 per cent. for primiparæ and a larger percentage for multiparæ; with conjugates between 9.5 and 8.5 cm. in 2.7 per cent. In 222 cases of generally contracted pelves with conjugates 10 to 7.5 cm. assistance was required in 9 per cent.; with conjugates 8.5 to 7.5 cm. assistance was needed in 16 per cent., and with conjugates from 9.5 to 8.5 cm. no assistance was required.

In these 726 cases 91 per cent. of the labors were considered normal—i. e., they were like a series of the same number of labors in normal pelves. In 44 of these cases the children were stillborn. Of the 64 cases requiring assistance because of the pelvic contraction, 25 chil-

<sup>1</sup> American Journal of Obstetrics, September, 1904.



dren were saved and 39 were lost—a total loss of 83. I believe that many, if not all, of those children passing through the conjugates below 8 cm. could have been saved by Cæsarean section, and that almost all of those passing through conjugates above 8 cm. could have been saved by the induction of premature labor. I therefore wish to emphasize the usefulness of inducing labor in the *lesser* degrees of contraction *in order to give nature the little assistance she may need to save the children that without this aid are frequently lost after version or a difficult forceps operation at term.* When a patient is first seen too late to induce labor at the most suitable time, I never allow her to go to or beyond full term, but terminate pregnancy at once and deliver as may seem best after the test of labor. The interruption of pregnancy must not take place too early and thus risk losing the child from prematurity, or too late, necessitating a difficult operative delivery, thereby increasing the mortality, even of children not excessively premature. To avoid these errors requires experience, study, and a keen “mechanical sense.” The four factors to be determined are: 1. The size of the pelvis. 2. The individual’s expulsive energy of the uterus. 3. The determination of the exact duration of pregnancy or its equivalent, the degree of prematurity of the child at the time selected for terminating the pregnancy. 4. The relative size of the child’s head. The size of the pelvis can be accurately ascertained. The expulsive energy of the uterus can be estimated, in multiparæ, from the history of previous labors; in primiparæ it must be left to the test of actual labor.

The determination of the exact duration of pregnancy is difficult. When the cessation of menstruation and the date of quickening are known, or, better still, the probable date of conception, the duration of pregnancy can be fairly accurately predicted. The possibility of conception having occurred in the premenstrual and not in the usual post-menstrual days can be a source of error of two or three weeks; and when this factor is in doubt, if the remaining factor will permit it—*i. e.*, the relative size of the child’s head—the date selected for inducing labor should err on the side of deferring that date from ten days to two weeks.

For determining the relative size of the head to the pelvis I believe that the method of Mueller, by which he manually engages the head in the pelvis by suprapubic pressure and studies the relation of the head to the symphysis, by abdominal and vaginal examination, depends for its accuracy upon individual skill and experience, and to be the most reliable of all methods. In reaching my conclusions I have placed most reliance upon suprapubic pressure of the head and a reliable history of the menstrual period. An operative delivery, version or forceps, after the induction of premature labor, adds a distinct risk to the child, and when possible should be avoided. After true labor pains have

begun and the cervix has dilated, it is a positive advantage to place the patient in the combined Trendelenburg-Walcher posture. This posture has at times avoided the necessity for interference, and when version or forceps has been required they may be performed with greater ease and safety to the infant.

When the conjugate is between 8 and 8.5 cm. the operation is deferred until the thirty-sixth week; if the conjugate is above 8.5 cm. and a careful estimate of the relative size of the head to the pelvis will permit it, pregnancy is allowed to continue beyond that date.

The method I use to induce labor is as follows: A hollow linen bougie containing a stylet having the curve of a prostatic catheter is passed through the cervix and gradually onward into the uterus. As the bougie enters the uterus the stylet is gradually withdrawn; this procedure renders that part of the bougie within the vagina stiff and unyielding and that part within the uterus flexible; the point of the bougie is thereby directed upward and toward the uterine wall and does not injure the amniotic sac, and prevents the coiling of the bougie within the uterus. Traction on the cervix with a double tenaculum is necessary in most cases. The largest-sized Voorhees bag is immediately introduced after the bougie has been placed; a few whiffs of chloroform may sometimes be required in nervous women to do this. If pains are slow in developing and it is desired to produce a prompt onset of labor the vagina is distended with Braun's kolpeurynter and intermittent traction practised upon its stem. When a Voorhees bag can with gentle traction be drawn through the cervix, an instrumental delivery or version and extraction can be immediately performed if indicated.

An analysis of 30 cases shows neither maternal mortality nor morbidity; 23 infants are living, 7 died. Two were stillborn, 1 a monstrosity and 1 from impaction of the chin after version; 2 died from prematurity, 1 from infection of the navel, 1 from intraperitoneal hemorrhage, and 1 from aspiration pneumonia.

**Hebotomy (Extramedian Symphysiotomy).** Van der Velde<sup>1</sup> reports several later cases which he has delivered by the operation of hebotomy, in which the division of the os pubis is made with a saw and by which a permanent expansion of a narrow pelvis is obtained. The first case was a primipara, very small, aged thirty years. Vertex presentation, pelvis flat, rachitic, with a circumference of 75 cm. and a diagonal conjugate 9.5 cm. The membranes were ruptured, labor having begun twenty-four hours previously. The head was fixed in the pelvis, the presentation was L. O. A., and pains were very strong. After waiting three hours the head was still impacted and it was decided to do hebotomy.

<sup>1</sup> Zentralblatt für Gynäkology, 1904, No 30; Annals of Gynecology and Pediatrics, October, 1904.

Chloroform was used as an anæsthetic. Immediately upon separation of the bone the sawed surfaces separated 3 to 4 cm. There was very little bleeding, the wound was separated from the birth canal, and the fascia was uninjured.

The head was pressed through the brim by Hofmeier's manipulation, when the divided ends of the bones separated 5 cm. The pelvis was then pressed together and further delivery accomplished by forceps. The muscles of the pelvic floor and the narrow vulvovaginal ring opposed so strong resistance that a deep incision was necessary to the right, obliquely and downward. The child was born alive. The biparietal diameter of the child's head was  $10\frac{1}{2}$  cm., the bitemporal 9 cm. The edges of the wound were brought together and about a finger's breadth of space was left between the sawed ends of the bones. The patient was able to walk in three weeks, and upon examination later it was found that a firm callus had united the severed bones immovably. After union her pelvis, which had formerly been symmetrical, was asymmetrical. The distance from the right anterior superior spine to the symphysis was 17 cm., on the left 19 cm. In May, 1904, when the patient was again pregnant, no callus could be felt and there was nothing to show that an operation had been performed except the asymmetry and enlargement of the pelvis. The second case was one of twin pregnancy. The pelvis was flat, rachitic, and the diagonal conjugate measured  $9\frac{1}{2}$  cm. The patient was placed in the gynecological position and chloroform given. An incision was made two fingers' breadth to the right of the median line, beginning at the upper border of the pubic bone and running downward and inward through the outer side of the labium majus to below the border of the pubic bone. The index finger of the left hand was then passed to the edge of the pubic bone and used as a guide to pass a needle around the os pubis. When the point appeared on the opposite side a Giglio saw was attached to it and it was withdrawn. The bone was easily sawed through; about forty ounces of blood was lost during the operation. The saw was then withdrawn, a compress placed over the wound, and the first child easily delivered; the second child followed immediately and the placenta was expressed. Postpartum hemorrhage was so free that the uterus had to be packed with gauze. The wound was then closed with sutures and the patient placed in bed with her pelvis supported on each side by sand-bags. There was some slight œdema of the labium afterward. A callus was formed by the eighth day, and on the tenth day the patient was able to move her legs. As a result of the operation the distance from the right anterior superior spine to the os pubis was increased 1.5 cm.

The writer considers hebotomy a much preferable operation to symphysiotomy, as afterward there is a permanent enlargement of the

pelvis. After symphysiotomy the enlargement may only be temporary, and again we find that the cut ends of the symphysis at times fail to unite properly, causing a difficulty or inability in walking.

Among others who approve of and practice this operation is Doederlein.<sup>1</sup> He reports four additional cases which terminated successfully as regards both mother and child. He advises waiting before sawing the bone entirely through to determine whether or not it is possible for the fetal head to pass through the pelvis. A child whose head was not disproportionately large might pass through without the section of the pelvis. He also recommends the application of a sterile rubber tube around the pelvis to prevent the excessive spreading of the pelvic bones during the extraction of the child's head.

The operation of hebotomy, originated by Stoltz, has never had a wide popularity, and some operators, after having performed it a few times, have abandoned it as having no advantages and being more formidable than symphysiotomy. The present very limited field of usefulness of the latter operation indicates that hebotomy is an operation not likely to be widely employed, since its claims for superiority over symphysiotomy—diminished dangers and permanent enlargement of the pelvis—have not been completely established.

**Cæsarean Section for Myasthenia Gravis.** It is a very rare occurrence in the course of myasthenia gravis complicating pregnancy that one would resort to Cæsarean section. Such a case, however, was reported by Gemmell.<sup>2</sup> The clinical feature of the disease is weakness of some or all of the voluntary muscles, sometimes amounting to a paralysis. After a prolonged rest with appropriate treatment the affected muscles may again respond to the will, although they again become rapidly exhausted. Stimulation by the faradic current leads to a similar exhaustion. The muscles most frequently affected are those most commonly used, and the facial paresis and ophthalmoplegia give the patient a characteristic appearance. Sensory symptoms are absent and death terminates the disease in a large proportion of cases. No pathological structural changes have so far been found. Gemmell's patient was admitted to the Lying-in Hospital five days before labor was expected. Her condition was one of pitiful weakness and exhaustion, and during the first twenty-four hours she had four attacks of dyspnœa, and sleep was almost absent for the first forty-eight hours. The extreme gravity of the case had been noted and it was realized that death might occur during an attack of dyspnœa. The effect of the advent of labor was feared, and it was felt that if she did not succumb in the first stage attempts at the use

<sup>1</sup> Zentralblatt für Gynäkology, 1904, No. 42.

<sup>2</sup> Journal of Obstetrics and Gynecology of the British Empire, December, 1904.

of the secondary powers in the next would almost certainly bring on a fatal attack of dyspnoea.

It was determined to await the onset of labor and act accordingly. However, two days after admission the dyspnoea became urgent and the cyanosis marked. The following morning the respiratory movements were only those associated with hiccup, and the extreme gravity of the condition led to the decision to perform Cæsarean section as being the procedure which would most speedily terminate the pregnancy in a manner which could be most under control. The operation was rapidly carried out without difficulty, chloroform being used as an anæsthetic, and very little required. Uninterrupted recovery followed, accompanied by gradual improvement in the respiratory and myasthenic symptoms. A small piece of uterine muscle removed at the operation was examined for pathological changes, but with negative results. If such a case had been met with in the earlier stages of gestation the writer believes it would have been proper treatment to cut short the pregnancy.

**Rupture of the Uterus Twice in Six Years.** This noteworthy accident reported by E. Patz<sup>1</sup> occurred in a woman aged twenty-nine years. She was delivered of her first child with forceps at the age of twenty-two. Four years afterward a living child was born spontaneously, twelve months later an abortion took place, and her fourth pregnancy came to term and labor began August 4, 1898. Labor proceeded normally until the head appeared in the vulva, when it was decided to apply forceps. As the first blade was being placed in position the head suddenly disappeared. Five hours later when she was admitted to the hospital she was apparently moribund. She was covered with clammy perspiration, her lips were blue, cheeks sunken, and pulse scarcely perceptible. While fetal parts could be felt distinctly through the abdominal wall, no trace could be felt per vaginam. Rupture of the uterus had taken place and though it was considered scarcely probable that she would recover, laparotomy was performed. A dead child weighing about four and a half pounds was extracted, and much blood and clots escaped with it. There was a vertical laceration which involved the vagina from its attachment to the bladder and the entire length of the cervix uteri. All bleeding was stopped and an iodoform drainage was placed in the cervical tear and conducted out through the vagina. The laceration was then closed with silk, and the abdominal wound closed by suturing in layers. She was given a litre of normal salt solution subcutaneously and rallied well. At the end of four weeks she was discharged cured. The cause of the rupture was discovered to be disproportion between

<sup>1</sup> Wien. med. Wochen., August, 1904; Medical Review, October, 1904.

the size of the fetal head and the pelvis. The pelvis was of the generally contracted rickety type. She was a short woman with bilateral genu valgum and a waddling gait. She was warned that abortion should be performed if she again became pregnant, but July 13, 1902, she was again admitted in labor at full term. The os was fully dilated, the membranes had ruptured, and the head was engaged in the pelvis. Delivery by forceps was tried, but proved ineffectual and a craniotomy was performed. Her puerperium was normal and she was discharged six days later and again warned as to letting herself go to term. October 9, 1903, she was again admitted in labor. The os was not fully dilated, the head was engaged in the pelvis, and the membranes unruptured. The writer hoped to deliver by craniotomy when the os was fully dilated. Four hours after her admission the pains had entirely ceased and the fetal head had disappeared. The fetal form could be felt beneath the thin abdominal wall, but not per vaginam. One-half hour later she was anesthetized and the abdomen opened at the site of the former wound. A quantity of blood escaped and a dead child weighing about seven and three-quarter pounds was delivered with the placenta. The laceration involved the posterior aspect of the vagina and cervix in an oblique direction from left to right and from below upward. The old cicatrix was sound. To prevent further pregnancies a hysterectomy was done. A rubber tube was tightly wound around the cervix and adnexa at the level of the middle of the laceration, two long needles being inserted for additional security, and everything above the ligature was removed. A large drainage tube was then inserted into that part of the laceration below the rubber tube and conducted out of the vulva. The laceration was closed with sutures except for a small opening for the drainage tube immediately below the ligature. This was difficult on account of the friable nature of the injured vaginal wall. The abdominal wound was closed with interrupted sutures from the umbilicus to the uterine stump, which was fixed on either side to the wound with a continuous suture just below the level of the drainage opening. Convalescence was apyretic, the wound healed rapidly, and she was discharged five weeks after the operation. The frequency of rupture of the uterus, according to Bandl, is once in every 1180 labors; according to Franque, once in every 3225 labors. Those cases in which the child escapes into the abdominal cavity are even rarer. The prognosis is bad; the child usually dies immediately and the mother perishes from hemorrhage or shock. Should she survive these dangers she is subject to the dangers of a general peritoneal infection. The maternal mortality in the preantiseptic days was variously estimated at between 89 and 95 per cent. Treatment then was either expectant or directed to vaginal delivery at all costs. Since the introduction of asepsis lapar-

otomy has been performed frequently. It is remarkable that one patient should have survived two such operations.

**SPONTANEOUS RUPTURE OF UTERUS DURING PREGNANCY THROUGH THE CICATRIX OF A CÆSAREAN SECTION WOUND.** The following case was reported by Kerr.<sup>1</sup> The patient, a IV-para, had been admitted to the hospital for the purpose of having a Cæsarean section done for the second time. Two years previously she had been delivered by Cæsarean section by the author. Her previous labors had been very difficult and both times the children were extracted with difficulty and were dead. Her pelvis was of the flat rachitic type, the diagonal conjugate being three and three-fourths inches. She fell into labor twelve hours after admission, and was allowed to go on until the os was fully dilated, as it was intended to deliver her by symphysiotomy. When this stage was reached it was found that there was too great a disproportion between the relative sizes of the head and the pelvis to allow of it, and the Cæsarean section was chosen. The fundal incision of Fritsch was employed. The incision came upon the placenta, which was removed before extracting the child. The child was extracted and the uterine wound stitched with little trouble or bleeding. The wound healed by first intention and she left the hospital after making a perfect recovery. Upon her admission for the second operation she was, as near as could be judged, in her thirty-seventh week of pregnancy. Since the beginning of the pregnancy her health had been good and she had suffered no special discomfort. The abdomen was irregularly enlarged, the bulk of the swelling being to the right side. After an enema given at midnight the patient complained of slight pain in the epigastrium, which extended upward and to the right. She slept from 12.30 to 5 A.M., when a sanguineous discharge was noticed coming from the vagina, and at the same time she complained of a slight pain in the right iliac region. At 7 A.M. her temperature was 97.6° and the pulse 80, and the pain, which had now spread over the abdomen and was not very great, was thought to be due to painful uterine contractions. There was no nausea or vomiting. At that time her condition was not considered serious, but the abdominal tenderness suggested the thought that the old uterine cicatrix had given way. As the pulse was 84, regular, and of good volume, the house surgeon was directed to look into the case carefully. One hour later the abdominal tenderness was more marked, the pulse 90, the temperature subnormal, and the breathing more rapid. She lay with her feet slightly drawn up and there was exquisite abdominal tenderness, more marked to the right and below the umbilicus; the pain also extended up to the right shoulder.

<sup>1</sup> Journal of Obstetrics and Gynecology of the British Empire, November, 1904.

On palpation the fetal parts could be readily defined; there was a dull note in the flanks when percussed. One-twentieth grain of strychnine was given and the patient prepared for operation. She was anæsthetized and the abdomen was opened along the cicatrix of the previous incision. A large quantity of dark-colored blood immediately escaped and the intact membranes and placenta with the enclosed fetus presented. The uterus lay retracted, behind and down toward the pelvis. A full-term dead child was extracted from the membranes. The uterus was then examined and found to have a transverse rupture extending over the fundus of the uterus, evidently through the cicatrix of the former incision. There were two slight adhesions, one to the omentum and one to the abdominal wall. A supravaginal hysterectomy was done and the patient made a good recovery. Several features are worth particular attention. The slight alteration of pulse tension and rate and the absence of collapse; one is usually apt to consider complete collapse an essential feature of this condition. The writer then considers the following questions which arise in connection with the case: 1. Did the fact that the incision was a fundal one predispose to rupture? 2. Was there anything in the uterine wound at the previous Cæsarean section which favored the rupture? 3. Is the danger of rupture of the cicatrix such that one should condemn non-sterilization? As regards the first of these questions he believes that a fundal cicatrix is more liable to give way than an ordinary longitudinal incision, because the latter is strengthened by the adhesions to the abdominal wall which usually form after this incision. He would never employ the fundal incision were he to leave the uterus behind. In another case in which he operated for the second time the old fundal cicatrix was found thinner than the rest of the uterine wall. Meyer<sup>1</sup> also reports a case of rupture through a fundal cicatrix. Regarding the second question, it was stated that the fundal incision encountered the placenta, and therefore in closing the wound the placental site had to be stitched. It is quite conceivable that union may not be so firm under such circumstances. The placenta in the second instance was also planted over the fundus and the old cicatrix, and that doubtless also favored rupture. Meyer's case was just the same, the placenta was implanted over the old cicatrix. There was no suspicion of sepsis in Kerr's case; catgut was employed for suturing and the methods of Sanger and Cameron for insertion of the sutures were employed. Any cicatrix is liable to give way; there is therefore a distinct danger in not sterilizing the patient and preventing her becoming pregnant again. The question obstetricians will have to settle is whether or not this danger is so great that repeated section should be condemned.

<sup>1</sup>*Zentralblatt für Gynäkology*, 1903, p. 1406.



The practice at present is not to sterilize the patient at the first operation; this has become so on account of the good results obtained in repeated sections. Targett, Galabin, Horrocks, Koblanck, Guillaume, Woyer, and Everke have reported cases of rupture in which the anterior incision was used the first time. Williams' statistics of first sections done by Chrobak, Schauta, Leopold, Braun, Ohlshausen, Zweifel, Reynolds, Bar, Charles, and Chagrin, in a total of 335 operations, show a gross mortality of 6.8 per cent. The writer's mortality in 30 cases was 6.6 per cent. The statistics of Wallace on repeated Cæsarean sections shows a mortality even lower than the above figures. Kerr's question then, "Is the danger of rupture of the cicatrix such that one should condemn non-sterilization?" it will be noted, is answered in the negative.

**Intrapelvic Hæmatoma following Labor.** A rare and very interesting case is that reported by Williams.<sup>1</sup> The patient was aged thirty-three years and had been married three years. When first seen in consultation she had been delivered three hours previously of her first child, which weighed under six pounds. The labor was slow and was terminated by an easy, low forceps operation without anæsthesia. The placenta was shortly afterward expelled and her condition seemed to be most satisfactory. Almost immediately after delivery the patient began to complain of intense pain of a tearing character about the rectum; this was so severe that an opiate was required. The pain became more severe and the patient gradually passed into a state of collapse. Three hours after delivery her pulse was between 160 and 170; she was greatly shocked and complained of intense pain. The subcutaneous injection of salt solution and the administration of strychnine and whiskey improved her condition temporarily, but it soon changed for the worse. On palpating the lower abdomen a large, round, fluctuating tumor about the size of a man's head was found. It extended up to the umbilicus and was surmounted by a hard, rounded body, about the size of two closed fists, which was clearly the uterus. A vaginal examination revealed the posterior and left vaginal fornices bulging markedly, and through them a wave of fluctuation could be transmitted to the abdominal tumor. The cervix was not torn and was displaced upward and backward; the external os lay to the right of and just in front of the sacral promontory. A diagnosis of internal hemorrhage was made; it was supposed to be due to incomplete rupture of the uterus with escape of blood between the layers of the broad ligament. Immediate operation was advised and begun after some little delay. The patient at that time was practically pulseless, though the heart could be distinctly heard on auscultation. In making the abdominal incision

<sup>1</sup> Johns Hopkins Hospital Bulletin, No. 158

after cutting through the fascia the components of the abdominal wall could not be distinguished and a loose, blood-stained tissue came into view. The fingers instead of reaching the peritoneum passed directly into a large cavity filled with clotted blood, situated between the symphysis pubis and the anterior and inferior wall of the bladder, and extending between the folds of the broad ligament to the left wall of the pelvis. Under the impression that he was dealing with a ruptured uterus, the incision was extended upward and disclosed a normal uterus except for its unusual position. The finger of an assistant passed through the cervix established without any doubt that there was no communication between the uterine canal and the cavity described. The peritoneum above the hæmatoma was then closed to prevent any contamination of the abdominal cavity, and the hæmatoma rapidly drained. The bleeding point was found to be an oozing surface upon the anterior and inferior surface of the bladder in which there were no large vessels involved. The cavity was then tightly packed with iodoform gauze, the vagina also being packed to afford counter pressure. A piece of iodoform gauze was left in the abdominal wound. The packing was left in place for three days before being replaced; the wound rapidly closed. This condition following labor is extremely rare, as only about 20 cases are recorded in literature, and to the best of the writer's knowledge this is the only case of the kind in which an operation was done. The probable cause of the hemorrhage was a tearing of the antevesical plexus of veins during the forceps operation, though it was not necessarily the cause of it, as several cases have followed normal and spontaneous delivery. A differential diagnosis between rupture of the uterus and this condition is practically a matter of comparative indifference, as in either event operative measures are required if the hæmatoma increases in size and the patient's condition becomes at all serious.

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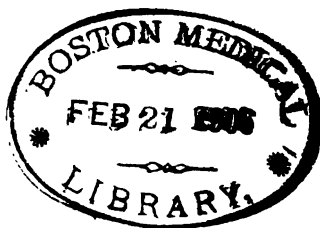
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